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Original Articles.

THE SALTS OF STRONTIUM.[1]

BY HARRY L. CLAYTON, M.D.

AMONG the contributions of science to the well-being of society which have been made during the past decade, there are few equal in importance to those furnished by therapeutics.

Medicine and surgery are coëval with human society itself; they have participated in the general progress along with other branches of learning, each achieving fresh laurels of victory year after year. Recently a drug has been introduced to the profession which is, as yet, comparatively new, but surely destined to occupy a prominent place in modern therapeutics. I refer to strontium.

The results of the investigators of its salts during the past few years have awakened an unusual amount of interest in the medical fraternity, and have caused a series of most searching investigations in their behalf, because of long suspected toxic properties. Strontium belongs to the dibasic group of metallic elements, and has for its atomic weight 87.4. It is a malleable metal, of a yellowish color, and derives its name from Strontian, a mining town in Argyleshire, Scotland, in the neighborhood of which place the mineral known as strontianite, or carbonate of strontium was first found in 1787. It has since been found in Asia, Saxony, Hungary, France, New York, and in the vicinity of Lake Erie. The famous Carlsbad water contains strontium. This metal ranks after lithium and before calcium among the alkaline earthy matter, and may be employed as a succedaneum for lithium. Its position among the chemical elements is between barium and calcium, but it was not isolated until 1788, by Sir Humphrey Davy. Strontia is an alkaline earth of white color, and is composed of 8 parts of oxygen to 43.8 of the metal strontium. The sulphate, known as celestine (cœlum, the sky), in allusion to its bluish color is very sparingly soluble in water. The borate and phosphate are wholly insoluble in water. The bromide, chloride, acetate and nitrate are soluble in 1½ parts of water; the iodide in 2 parts, the benzoate in 15 parts of water. Hitherto the principal use of strontium was in the preparation of pyrotechnic displays; the nitrate, especially being employed for this purpose, any of the salts of strontium will impart a crimson color to a flame. Its intimate relation to barium has rendered its isolation very difficult. However, this is readily accomplished by the use of bichronate of potash, this agent at once precipitating barium from acetic solutions of strontium. Strontium or any of its salts may be obtained by dissolving the carbonate in the appropriate acid or by igniting the cheaper sulphate with coal, whereby the sulphide is produced and then dissolving the latter in acid. To test the purity of a strontium preparation, the following is to be recommended: Take ten grains of the salt and dissolve in one fluid ounce of distilled water and filter clear. To this add one fluid ounce of a solution of bichronate of potassium. If barium be present in only $\frac{1}{20\,00}$ of a grain, it will be precipitated. Strontium is not precipitated by sodium silica fluoride.

Experiment No. 1.—My experiment was with the bromide, a sample of which I procured at one of the leading drug stores in this city. I commenced with the administration of it in 15-grain doses three times a day, via stomach per œsophageal sound, increasing the dose to 25 grains at each dose. The dog was of medium size and weight. On the evening of the third day, inasmuch as I had been unable to detect

[1] Prize thesis on Original Research. Medico-Chirurgical College, awarded at Commencement, May 3, 1892.

any effect of the dog, I injected a solution containing about 40 grains of the salt into the external saphenous vein. In about five minutes the animal was seized with convulsions and died. Pupils were considerably dilated, respiration was decidedly embarrassed, and pulse greatly decreased in power and frequency, before death supervened. I must confess that I was considerably chagrined at the sudden demise of the victim of my experiment, and at a loss to account for any reason why such an unfortunate termination should have resulted, inasmuch as its innocuous properties had been so extolled by M. Labordé. Suddenly it occurred to me that my sample might have been impure, hence I tested a solution of it with bichromate of potash, in the manner already referred to. A copious yellow precipitate, which responded to the characteristic tests for barium, resulted. Here, therefore, was the explanation for the fatal result of my experiment, my dog having been poisoned by the excess of barium in the strontium which I had used. The spasmodic muscular contractions and fibrillary movements, undulating in character, as mentioned by Raboteau in his experiments with the chloride of barium, were not manifested in this case. Prof. J. V. Shoemaker very kindly gave me a standard solution of lactate of strontium (Paraf Javal) and also a quantity of the bromide and lactate for experimental purposes. The solution is colorless, and has a very slight, sweetish taste. It resembles an elixir. The bromide occurs in transparent needle-like crystals, having an exceedingly pungent taste. The lactate occurs in small granular masses, not unlike starch in appearance, and has a warm alkaline taste. It is made by mixing the nitrate of strontium with lactic acid or by saturating the latter with strontia or carbonate of strontium. It may also be readily prepared by uniting directly the hydrate of strontium with lactic acid, by diluting the latter with 10 parts of distilled water and adding the strontium until the liquid does not impart a red color to blue litmus paper. The carbonate of strontium or strontianite may be utilized instead.

Experiment No. 2.—Dog weighing twenty-nine pounds, to which I gave 15 grains of the chlorate of strontium by means of the œsophageal sound. This produced no effect, so I increased the dose to 25 grains three times daily. After receiving a single dose of 35 grains (although the small amounts produced some diuresis), the animal urinated nineteen times in less than a half hour, from two to five and a half fluid ounces being passed each time. No depressant action was manifested until these large doses were administered, when continued anorexia persisted and slight dilatation of the pupil occurred. At this limit I discontinued the use of the drug. Having made this trial of the physiological action and impression of strontium, and being desirous of comparing its action with (Experiment No. 3) with the corresponding salt of barium, I selected a strong, healthy dog, weighing thirty pounds, and injected a solution containing 5 grains of the salt (chlorate of barium), and in less than three minutes the heart was lessened in impulse and frequency, temperature sank $1\frac{2}{5}$° F., and pulse decreased from 110 to 87. The pupils dilated to their maximum extent, and in this condition the dog remained for several minutes. I then repeated my injection, but lessened the amount of salt to 2 grains. In two minutes, forty seconds, a convulsion ensued, accompanied by a profused diuresis, with a rapid and stertorous respiration. Violent emesis followed, during which the animal died, exactly twenty-one minutes from the time of the first injection.

Death was attributed to a paralysis of the respiratory centers, situated in the medulla oblongata. The general contractions and undulating movements, absent in the other case of barium poisoning (Experiment No. 1) were well marked in this case. In the first case, the amount of barium present, while sufficient to produce death was probably not in sufficient amount to occasion these movements. It evidently takes more than from 3 to 5 grains to make such a decided impression on the muscular elements and peripheral nerves. The post-mortem exhibited marked changes in the blood, it being abnormally darker in color, and the blood-vessels contracted. Microscopical examinations revealed considerable disintegration of the red corpuscles. The brain was engorged with blood and the mucous membrane of the stomach, and entire alimentary tract was deeply congested and ecchymosed in spots. General hyperæmia of the lungs, spleen, and liver (although the latter presented fewer pathological changes than any other organ of the body). The spleen was also somewhat enlarged. The kidneys were intensely infiltrated with blood. The urine contained some albumen, and a few hyaline and granular tube casts, but the kidneys had not undergone any marked morbid changes. May not this have been due to the action of the drug? M. Labordé claims that the strontium has no diuretic properties, but in experimenting with the solution of lactate of strontium, I took one fluidounce three times daily for several days, each fluidounce representing a drachm of the salt, or 180 grains daily. Without a doubt it made a profound impression on the renal secreting functions, not causing as much diuresis as in the case of the dog, but certainly stimulating the kidneys and increasing the amount of urine excreted. In addition, my appetite improved and digestion was facilitated, it overcoming the hyperacidity with which I am almost constantly annoyed. The beneficial action which the strontium affords to the digestive functions may be attributed to the fact that it causes the food to be more thoroughly digested, and therefore not so many ptomaines are formed and absorbed into the blood.

Strontium is antiputrescent and antiseptic to the tissues, and is also anthelmintic, for in all the post-mortem examinations of dogs which had taken the drug in considerable amounts, we were unable to find traces of tænia or other parasites. To meet the demands for its application as a vermifuge, Paraf Javal have prepared biscuits containing the phosphate and sulphate of strontium. They are especially safe and easily administered to children, and are pronounced to be very prompt and effective without giving rise to gastric or other irritations. The strontium salts are eliminated partly by the urine and feces, but a portion is retained in the bones, liver, and in a less degree in the soft tissues of the body. The latter statement may be somewhat disquieting, but when one recalls the very sparing solubility of the sulphate, it is to be expected. M. Labordé has given the bromide for epilepsy, in doses from 75 to 200 grains daily, the latter being the maximum dose tolerated.

M. Ch. Féré also made some interesting experiments in epilepsy, first administering it to a series of epileptic cases, who had been long treated by the bromide of potassium, which had greatly ameliorated the condition in a general way. Yet the patients suffered serious relapses, and very nervous crises often supervened. After using the strontium these unfavorable relapses and crises were absent, and did not reappear, and in his report he states, as his conviction, that "this salt should supplant the bromide of potassium

in the treatment of epilepsy." This observation also discovered the important fact that a given quantity of the bromide of strontium elicited the same therapeutic effect as an equal amount of potassium bromide, which is extraordinary, as the former contains about 1-3 less bromide than the latter. The strontium salt exerted only 1-5 as much toxic power as the potassium.

Germain Sée claims good results for it in dyspepsia, and reports 30 cases attended with hyper-hydrochloric acidity, which were speedily benefited, especially as regards the diminution of gas. Six of the cases, one being a case of nervous vomiting, were permanently cured. Here, again, the bromide is to be preferred. It sedates nervo-gastric irritation, and controls morbid gastro-intestinal fermentation, without causing depression or exciting any toxic symptom. It is especially applicable in those gastric phenomena which are manifested by sour and acid regurgitations, obstinate pyrosis and in flatulent and gastralgic dyspepsia.

Dujardin-Beaumetz found it efficient in cases of albuminuria, it diminishing the amount of albumen one-half. However, it never altogether stopped it, the albumen returning on the discontinuance of the drug.

Dr. Constantin Paul, in a report to the therapeutic society, speaks as follows: "The lactate of strontium (Paraf Javal) has done excellent service in parenchymatous, and rheumatismal nephritis; in the nephritis of gouty and scrofulous patients, and in the albuminuria of pregnant and recently delivered women. I have reason to hope for the same excellent result in scarlatinal albuminuria. Even the presence of intense febrile processes does not interfere with the action of lactate of strontium in parenchymatous nephritis." He recommends, to begin its administration when the urine is scanty and there is a tendency to anæmia. It has been found beneficial in diabetes of hepatic origin, and in cirrhosis of the liver, the anorexia and gastric symptoms disappearing, and finally the glycosuria, polyuria, and polydipsia being ameliorated.

In a case, treated by M. C. Paul, suffering from albuminuria, he found it reduced the amount of albumen to one-half. The continuance of the drug for a month caused a continued diminution of the albumen, at the end of which time the remedy could be abandoned. The amount of albumen did not then augment, but remained comparatively low. His treatment embraced a milk diet also. In the case of nephritis, probably amyloid in character, in a scrofulous patient suffering from pyæmia, with considerable pyrexia, the result was most flattering.

The remedy must not be withdrawn too early in nephritic cases, or a rapid increase of albumen will ensue; it is of no service after uræmic symptoms appear. Dr. Monin derived marked benefit in nervous dyspepsia with impaired and slow digestion and extreme atony, vomiting, fermentation and epigastric pains. It has also been used with marked benefit in round ulcer and in the gastric sensibility of neurasthenia. M. Paul mentions a case of hystero-epilepsy in a young woman, the attacks occurring regularly with her menstrual period, which had resisted the use of the bromide of potassium in drachm doses daily, but the strontium appears to have effected a cure, inasmuch as she had no further attacks.

In a case of puerperal albuminuria, in which I tried it, the success which attended its use was very encouraging. In five days the amount of albumen rapidly diminished to less than half the original amount, and the constitutional symptoms were greatly decreased. In the same patient, prior to her confinement, it allayed the persistent vomiting which had continued present throughout the entire period of gestation. In comparing the relative value of the salts of strontium with similar ones of potassium, I found that an injection of the bromide of strontium hypodermically in a guinea pig, in a 10-grain dose, caused local anæsthesia with some œdema; in ten to fifteen minutes there was a diminution of reflex movement and some stupor; in a few hours the animals had returned to a normal condition. (Experiment B.) Fifteen grains of the chlorate of strontium hypodermically or intra-muscularly in the rabbit gave neither constitutional nor local symptoms, while the chlorate or sulphate of potassium, rapidly injected (Experiment C), in one-half the dose (7½ grains) in the guinea-pig and (Experiment D) same original dose (15 grs.) in the rabbit, caused paralysis of sensibility and motion, first in the part injected and subsequently in the remainder of the body. (Experiment E). I injected 25 grs. of the sulphate of potassium hypodermically in a guinea-pig weighing eight pounds, and in twenty-four hours death supervened, accompanied by ultimate phenomena of collapse and asphyxia. (Experiment F). The same amount injected intravenously in a small dog, its primary action was to retard the heart's action, reducing the number of beats per minute to a minimum degree, giving rise to marked gastro-intestinal symptoms, *e. g.*, profuse diarrhœa and vomiting, which, however, were more or less evanescent in character. (Experiment G). The chlorate of strontium, on the other hand, in the same doses and in similar experimental conditions, does not produce these untoward symptoms, neither affecting the cardiac nor respiratory functions. It produces only a stimulative action of the salivary and urinary secretions. The iodide of strontium does not give rise to gastralgia or palpitation; it slightly increases the vascular and the respiratory functions, but it does not engender acne or other skin phenomena as does iodide of patassium. It possesses also an advantage in the fact of its rapid elimination by the kidneys. It may prove useful in syphilis.

In adenitis, arthritis, asthenia, chronic bronchitis, hydrargyrism, saturnism and scrofula it has also given remarkable results. Many mineral waters employed in the treatment of rheumatism and rheumatoid affections appear to owe their virtue to the presence of strontium salts. In order to complete this thesis in time for its examination by the faculty, it became necessary for me to conclude some of my experiments rather prematurely, so as to include a report of them at this time. The following are the reports of the post-mortem examinations:

Experiment No. 4.—The dog, a strong and vigorous one, was given 60 grains of the sulphate of strontium daily, for nineteen days, and was well during the entire period of the experiment, having lost but one-half pound during the whole nineteen days, and this I attribute to bad hygiene, circumstances being such that good hygienic surroundings could not be secured. I killed him by penetrating the bulb on the 13th day of April. Every organ was normal. A chemical analysis of the urine, liver, bones, and especially the feces revealed the presence of strontium. There were no traces of tænia.

Experiment No. 5.—A second dog, equally healthy and under the same hygienic conditions, received 40 grains of the sulphate of potassium daily, for the same length of time, and lost about a pound and a quarter in

the three weeks. I killed him on the 13th day of April also; the autopsy showed deeply congested mucous membrane of the stomach and intestines, the latter exhibiting a few superficial ulcerations. In this case we found a great number of intestinal worms.

Experiment No. 6—Comparative Value of the Neutral Tartrates of Strontium and Potassium.—Dog, No. 6, received 2 drachms of the salt per day (tartrate of strontium).

Throughout the nineteen days, the dog was well and very "frisky," having a voracious appetite and not losing in weight. The dog passed twenty-seven quarts of urine during the time, which was acid in reaction. To measure the quantity of urine I kept him chained within a limited space, the floor of which cage was made in such a manner as to drain into a receptacle at its side. The dog being killed, the autopsy showed no appreciable congestion of the gastro-intestinal mucous membrane, or of the kidneys. The salt was found abundantly in the urine, feces, bones and liver.

Experiment No. 7.—This dog received, under the same conditions as the preceding one, 100 grains of the neutral tartrate of potassium daily. Complete anorexia, from the first, followed by an alternating fœtid diarrhœa on the ninth day, which continued up until the day I killed him. He had lost two and one-quarter pounds during the nineteen days. The post mortem examination exhibited a pathological condition of the stomach and intestines, characterized by decided injection of the mucous membrane, resembling ecchymotic spots. There was also thickening and hypertrophy of the mucous membrane and œdematous infiltration. The kidneys were congested, and the liver of a mahogany hue, and infiltrated with blood. The tænia present in this case were very abundant. The liver was also granular and very friable. In all these cases I administered the drug under consideration, in the animal's food, which consisted of meat broths and milk.

It was my desire and intention to make comparative tests with the ortho-phosphate of strontium and ortho-phosphate of potassium, but my inability to procure samples of them, thwarted me from experimenting in this direction.

The results of our experiments have established in our minds the fact that there is a constant difference between the potassium and strontium salts. The former, in the course of time, always produce bad results on the general system, while the latter, on the contrary, seem beneficial and favorable to the economy at large. These facts are incontestable, and show beyond question, from the study just made, that the strontium salts, and their compounds, are devoid of toxic properties, and that they possess an innocuous action which we are warranted in affirming completely. In conclusion, we would briefly summarize the auspicious qualities of the strontium salts and a few of their indications, as follows:

1. The purity of the medicament may be considered to be an absolute *sine qua non* for therapeutic efficiency.

2. It is perfectly innocuous.

3. It possesses no irritative action on the stomach; aiding digestion and stimulating the appetite.

4. It has a beneficial action in cases of dyspepsia, especially in those associated with hyperacidity or flatulence.

5. It is a perfect substitute for the bromide of potassium, and, therefore, should supplant it in the treatment of epilepsy.

6. It is advantageous in the treatment of albuminuria, diabetes of hepatic origin, and the various forms of nephritis.

7. It may be employed as a succedaneum for all the alkaline bromides; having an elective action as an antiseptic, antifermentive and antiparasiticide agent on the entire gastro-intestinal tract, properties which have been improperly claimed for several drugs. Naphthol, the salicylates, sulphite of soda, etc., etc., will sometimes act in certain cases, if given in elevated doses. But they are unreliable, often toxic and always irritating in the end, and their continued use is impossible, while the strontium preparations never irritate, even in large doses.

Finally, its anthelmintic actions claims our attention. That it possesses this property to a remarkable degree can not be questioned; the results of our experiments have shown it. Undoubtedly the salts of strontium will have other uses on lines of treatment to which we have not here referred, for it affords a broad field for investigation and research.

The few indications we have mentioned justify us in saying that these qualities alone must secure for it a very exalted place in modern therapeutics.

MIDDLETOWN, DEL., April 14, 1892.

ELECTRICITY *vs.* THE CURETTE IN THE TREATMENT OF BLEEDING FIBROIDS OF THE UTERUS.[1]

BY AUGUSTIN H. GOELET, M.D.,
NEW YORK.

IT has come to the knowledge of the writer that patients to whom electrical treatment had been suggested for the relief of painful and bleeding fibroids, have sometimes been misled by certain opponents of this agent, and made to believe that the application of the curette to the endometrium would do as much for their condition as electricity, particular stress being laid upon the assertion that this operation possessed the additional merit of involving a very much shorter period of treatment. Were this true no one would be more willing to admit it than I, and, for obvious reasons, more willing to adopt it in preference to the other more protracted method of treatment.

It is time the general medical public should know just what is to be accomplished by either method properly carried out. That is, just how little may be expected from curettement, and the uncertainty of permanent benefit on the one hand; and on the other hand, how much is to be gained by the use of electricity, and the permanency of the result obtained.

Of curettement it may be said that it will sometimes temporarily arrest the bleeding, though this result is by no means constant, nor is it ever permanently effective, frequent repetition of the operation being necessitated by recurrence of the hemorrhage. It exerts no possible effect upon the growth of the tumor, either in reducing its size or arresting its development, consequently the pressure symptoms and harrassing pains are unrelieved by it. While, on the other hand, the irritation produced by the traumatism inflicted upon the endometrium may aggravate the peri-uterine engorgement, and cause increased development of the tumor by the formation of adhesions between contiguous peritoneal surfaces, with more permanent fixation of the mass and increased blood supply. The patient may thus be rendered more un-

[1] Read before the Gynæcological Section of the New York Academy of Medicine, May 26, 1892.

comfortable, since the discomfort of a large fibroid is mainly due to its immobility, and the constant pressure upon the nerves of the pelvis and important pelvic organs. When comparative mobility can be preserved or secured the suffering caused by these tumors is greatly lessened.

Let us consider the causes of the hemorrhage and see if this operation alone directed against one symptom can possibly be expected to exert any permanent benefit.

The hypertrophied and hyperæmic condition of the endometrium, which is held accountable for the hemorrhage, is brought about by certain influences exerted by the fibroid in the uterine wall and its pressure in the pelvis, chief of which is obstruction to the return circulation and consequent blood stasis. The hyperæmia is the result of an increased blood supply from hypertrophy of the arteries supplying the uterus, and also from new blood-vessels derived from attachments with adjacent surfaces by adhesions. When the tumor has attained such a size as to press upon the pelvic or abdominal viscera, or the walls of the pelvis, adhesions are formed between the contiguous peritoneal surfaces in consequence of a peri-uterine inflammation, the result of irritation induced by the fibroid, and additional nourishment and stimulus for its growth is then furnished by new blood-vessels entering through the adhesions.

The hyperæmia of the endometrium then is secondary to a condition beyond it—blood stasis involving the whole mass from obstruction to the return circulation and increased arterial blood supply. The irritation exerted by the presence of the tumor in the uterine wall is likewise an important factor in the causation of this condition. It is a well-known fact that the endometrium is rapidly reproduced, and since its removal by the curette exerts no influence upon the condition which produces its hyperæmia, that is, does not cause a diminution in the size of the tumor or loosen its attachments, or relieve the blood stasis and increased blood supply, the same condition reverts in time and with it the hemorrhage.

Against the operation it may be urged that a needless shock is inflicted upon a system already greatly exhausted by repeated hemorrhages, and deranged by the nervous strain and anxiety consequent upon the condition. This shock should not be ignored and cannot be denied, since it is considered necessary to anæsthetize the patient to enable her to bear the operation.

The increased vascular pressure caused by large fibroids, to which attention has been drawn by some writers, reacts upon the cardiac muscle and engenders a tendency to fatal collapse after operations in these cases, and is to be added as an additional argument against an operation which has so little to commend it.

Hofmeier, in 1884,[1] called attention to the frequency of cardiac disease in cases with large uterine fibromata as an explanation of the sudden death from shock sometimes observed after operations upon patients with these tumors. He referred more particularly to removal by hysterectomy, but he reports 5 deaths from this cause, occurring before any operation, and 5 following labor, out of a series of 18 cases, showing that sudden death may occur at any time and upon the slightest provocation, and any procedure which submits an added element of danger in these cases should be carefully avoided when possible. Other writers have made similar observations. Fehling, in a series of 14 cases found 4 with marked signs of cardiac alteration. He also observed symptoms of heart disease in 3 cases with fibromata of middle size. Dorner, in America, made similar observations, and Fenwick presented a paper on the subject to the Gynæcological Society of London (*British Gynæcological Journal*, Vol. II, p. 72). Of 18 cases of tumor of the abdomen collected by Sebileau, of France, for observation upon this point 17 gave evidence of cardiac disease.

The danger of perforating the uterine wall with the curette is regarded too lightly, though it has occurred more frequently than perforation with the electrode, which is held up to view as one of the horrors incident to electrical treatment. This objection can hardly be advanced, however, against the treatment of fibroids for the control of hemorrhage by electricity, as large carbon electrodes are generally employed for this purpose.

Of the treatment by electricity it may be said that it will positively control the bleeding, and the result will be permanent, if the details of its application are carefully observed. The pressure symptoms and harrassing pains are relieved, and there is almost always a very appreciable diminution in the size of the tumor, brought about by the application of the positive pole, for the control of the hamorrhage. The anti-hemorrhagic action of the positive pole is directly attributable to the cauterization of the endometrium, and the retractile nature of the resulting eschar, which places a barrier between the blood-vessels and the uterine cavity. But that the hæmostatic effect of the current is not entirey due to its local action, is proven by the fact that puncture with the positive pole, when the tumor can be reached by the vagina, and even ordinary vaginal application of this pole are known to produce the same effect.

There is a most pronounced influence upon the uterine and peri-uterine circulation involved in the action of the current, which is manifested by a diminution of the general hyperæmia of the whole mass and lessening of the blood stasis. This is due, no doubt, in great measure to the cataphoric action of the current, which produces depletion in the vicinity of the positive pole, by driving the fluids toward the negative.[1]

One of the first effects observed from the action of the current is an increased mobility of the mass from loosening of its attachments, and this aids greatly in relieving the obstruction to the return circulation by removing the constant pressure upon the vessels surrounding the uterus. This obstruction to the venous circulation constitutes by no means an unimportant factor in the reproduction of the hemorrhagic tendency of these fibroid conditions, and affords an explanation of the temporary effect of currettement.

The advantages in favor of electricity, besides those already mentioned, are that its application involves no shock; no anæsthetic is required; confinement to bed is avoided; the patient can be treated at the office, thus deriving all the benefit to be obtained from an out-door life, and immediate improvement in the general health is coincident to the treatment. A very considerable reduction in the size of the tumor is frequently obtained, especially from vaginal puncture. A symptomatic cure can be confidently prom-

[1] *Medical and Surgical Gynæcology*, Pozzi, Vol. I, p. 234.

[1] Buckmaster, in an essay published in the Brooklyn Medical Journal, November and December, 1888, illustrates the action of the current by some interesting experiments made upon fibroid tissue. The article is well written and should be carefully read by those who believe that electricity is incapable of exerting any decided influence upon morbid conditions of the female generative apparatus.

ised, and by this I mean absolute and permanent control of the hemorrhage, freedom from pain, and removal of the pressure symptoms. This statement does not apply, of course, to conditions where complications render the proper application of the agent impossible.

A careful observance of minute details is essential for success with this treatment. It must be understood that, if the hemorrhage is not controlled promptly by applications with the usual platinum sound electrode, the cervix must be dilated and a carbon electrode which will fit the cavity and form contact with its walls must be substituted, and the whole surface of the endometrium, from fundus to os internum, must be submitted to the action of the current.

The carbon electrodes of Apostoli, intended for sectional cauterization, are the only ones suitable for this purpose. Doubtless, many of the failures to control uterine hemorrhage with this agent are the result of an imperfect understanding of the principles involved in its application; and I am quite sure that failure is frequently due to the use of electrodes which are not adapted to meet the requirements, and but an imperfect application has been made. Contact with the surface is necessary for effective cauterization, and each section included by the electrode must be submitted to the continuous action of the current for at least five minutes in obstinate cases. The strength of the current is a matter of importance, and must be adapted to suit each individual case. It must be understood that a greater strength of current can be employed with the carbon electrode, because it presents a greater area of surface contact than the sound electrode, and because the cervical canal, which is more sensitive than the cavity, is excluded.

351 West Fifty-seventh Street.

ELECTRO-MEDICATION.

By. E. W. MURRAY, M.D.,
YANKTON, S. D.

THAT medicinal substances can be introduced into animal tissues by means of the galvanic current, I have thoroughly proved to my own satisfaction. But that this can universally be done by applying the medicament at the positive pole, as commonly taught, I deny; and base my conclusions upon experiments which I have recently made upon living tissues and upon raw beef.

That fluids may be made to traverse the tissues in the track of the current from the positive pole to the negative, I concede; but that medicinal substances, which may be in solution in the fluid, accompany it, is not always true.

I assume that the rationale of electro-medication depends upon this law:

A solution of an electro-positive agent should be applied at the positive pole, because the negative pole attracts it; and, for like reason, electro-negative solutions should be applied at the negative pole.

The electrical relations of the elements and their compounds may usually be quite readily determined by reference to an electro-chemical series such as may be found in some of the published works on medical electricity.

To substantiate the truth of this principle more thoroughly in my own mind, I have recently made the experiments above referred to, using glass cups with metallic connections, and applying the medicinal fluid directly to the skin or tissue to be acted upon. When at a loss to determine the chemical relationship of the medicine, I suggest applying it at both poles. The organic compounds should, I think, always be applied at both poles, to insure the medicinal effect of the entire substance. This plan, too, is advisable in applying other easily decomposed compounds; for example, iodide of potassium and chloride of sodium. In such instances it is possible, with a current which is but slightly painful, if the electrodes are of fair size, to produce an electro-chemical decomposition of the compound, in the case of iodide of potassium, free iodine appearing at the positive and potassium hydrate at the negative pole.

My recent experiments with iodine and iodide of potassium solutions:

Experiment I.—In the negative cup, iodide of potassium solution, one part of the latter to two parts distilled water. Reaction neutral. In the positive cup, distilled water. Reaction neutral. The cups were now applied to the surface of the tissues, three inches apart, and a current of 5 ma. passed for ten minutes.

The contents of the negative cup is now found to be alkaline; that of the positive is acid and responds faintly to the starch test for iodine. In fact, the distilled water has now assumed an orange tinge, due undoubtedly to the presence of iodine.

Experiment II.—In the negative cup, iodine solution. Reaction acid. In the positive cup, distilled water. Reaction neutral. The cups were applied as before, and a like current used for the same length of time, when the contents of the negative cup was found to be neutral, while that of the positive was now acid; responds to the starch test and is of a deeper orange hue than in Experiment I. The iodine solution which was placed in the negative cup, has now entirely lost its color and is as clear as crystal.

Experiment III.—In negative cup distilled water. Reaction neutral. In positive cup,[1] iodine solution. Reaction acid.

Application as before. In negative cup reaction is now alkaline and the fluid is still clear. No response to starch test. The alkalinity I attribute to absorption of that property from the fluids in the tissues by the negative electrode. In positive cup no change apparent.

Experiment IV.—In both cups iodide of potassium solution. Reaction neutral. After the usual application the contents of the negative cup is now found to be strongly alkaline. The clear solution in the positive cup has now become deeply colored with the iodine tinge, is acid in reaction, and responds to the starch test for iodine. The skin underneath this cup is stained with iodine, while no discoloration is found at the sight of the negative.

To recapitulate.—These experiments prove—

1. That iodide of potassium is decomposed at the negative pole, the iodine going to the positive.

2. That iodide, simple, passes from negative to positive.

3. That iodine, simple, cannot be made to pass from positive to negative.

4. That iodide of potassium is decomposed at both poles, iodine going to the positive and potassium hydrate to the negative.

Electro-medication is of undoubted value in many diseased conditions, prominent among which are glandular enlargements, such as goitre and hypertrophied tonsils. In a case of the former which I discharged four months ago as approximately cured, the

[1] Made by diluting the alcoholic tincture with water to saturation; filtering of the precipitate.

gland has continued to decrease in size until it is now wholly within the normal limit, and so much more rapidly has the gland decreased than the skin has contracted that the latter shows several prominent wrinkles.

I have also had excellent results in reducing tonsillar hypertrophy by this means, but it is more tedious than the galvano cautery puncture. I employ the method, however, in small children in which the hypertrophy is still recent in preference to the cautery, which is to be preferred in cases of long standing. I apply the cups (electrode) back of the angle of the jaw, using iodide of potassium in both, but changing the direction of the current every other sitting.

ELECTRICITY—SOME OF ITS USES IN GENERAL PRACTICE.[1]

By W. H. WALLING, M.D.,
PHILADELPHIA, PA.

THERE are three elements entering into the use of electricity in ordinary practice which tend to limit its use. The first in an inadequate knowledge of electro-physics and electro-therapeutics; the second, indifferent or ineffective apparatus; and the third, time. With most men the latter seems to be the chief objection.

When we consider how little was known until recently of that most mysterious and subtle force that we call electricity, and, in fact, how little is really known now, is it any wonder that repeated failures have been reported, even in the hands of some of our most skilful operators. But when we remember the brilliant results achieved by the use of this agent, shall we not consider it as a powerful ally, to be used when indicated? I say indicated, because it is not a panacea, to be administered upon every occasion, although from an extended experience, I may say that there is no one other single agent in all our armamentarium with which we may accomplish so much. In order to successfully apply electricity to diseased conditions, it is necessary that we have some understanding at least of electro-physics and electro-therapeutics. We must also have suitable and convenient batteries and electrodes. (The ones I have here to-day for the purposes of illustration are made by Mr. Otto Flemming, of Philadelphia.)

Allow me a few words regarding the currents, so-called, of the batteries. There is a general impression in the minds of nearly all of the profession, that the faradic battery gives a to and fro current without polarity. This, I think, an error. The faradic current is an interrupted, but not an alternating current, with a high voltage or intensity, but low in quantity. It has, consequently, true polarity, and should be used with this in view. Both poles produce sedation, the positive being the one generally used for this purpose, both with the faradic and galvanic series.

Treatment with Electricity.—For sprains, say of the ankle, it being the most common and painful, place the injured member at once in a pan of warm water, and protect the limb at the level of the water by a well-wetted bandage, thus preventing discomfort. The other foot should rest upon a thoroughly wetted sponge or towel placed upon a large metal plate, to which attach the positive pole of a galvanic battery, and the negative to the foot plate in the water, the battery, of course, being at zero. Turn on a gentle current, say 2 or 3 ma., and as the patient can bear it increase to 5, and let it run for half an hour. Repeat twice a day, keeping the foot at rest meantime, and you will be surprised at the rapid improvement. If you do not have a galvanic battery, use a faradic in the same way, commencing with a very mild current and increase gently to pleasant toleration. Treat all sprains or bruises in the same manner. I have found that the addition to the chloride of ammonium to the water was of advantage in such cases.

After fractures, or severe injuries without fracture, where there is great stasis, better results are obtained from daily applications of the secondary faradic current, from a smooth running battery, than from any other treatment. Use large electrodes, place the indifferent one at some distance from the active one, in order to get the proper polar effect, and use a mild current at first. If the injury be recent, apply the positive pole. If long standing, the negative.

Neuralgia.—If the pain be relieved upon pressure, use the faradic current, with the positive to the tender spot, and the negative at some distant point. These electrodes (here shown) are suitable ones for such purpose. If, however, there be pain upon pressure, a positive galvanic application must be made, and I frequently use cocaine, morphine, chloroform, aronitia, etc., etc., in this and other painful affections. In this connection I will say that I was the first to demonstrate the chemical polar effects of the galvanic series in such applications. If you wish to use any substance by electrical diffusion, or cataphoresis as it is called, consider the character of the substance thus used in its relation to the chemical poles of the battery. For instance, cocaine, morphine, aconitine, or any other substance of which you wish to introduce the base into the system, apply it with the positive galvanic. Where you desire to use iodine, iodide of potassium, or other salt, where it is the acid, or the substance taking the place of an acid, then apply it by the means of the negative pole.

I shall demonstrate this in a practical way, as follows: Having this absorbent cotton saturated with a solution of iodide of potassium, I place it at the positive pole, and another piece of cotton wet in water at the negative, with a piece of coagulated egg albumen between. Turning on a current of 30 ma. you notice how quickly the iodine appears at the positive pole and remains there. None is shown at the negative. With fresh cottons and carbons I reverse the current. No iodine shown at the negative, but you will soon perceive that the iodine has traversed the albumen, and appears in characteristic odor and color at the positive.

Drugs administered in this way will often relieve pain and discomfort when they cannot be used in any other manner to advantage. For instance, you may have a sore and painful bunion or other superficial tumor to treat. You cannot inject it, but you can apply a 10 per cent. solution of cocaine to it by the galvanic anode, using the cathode at some other point. Morphine, chloroform, etc., are used in the same way.

I have frequently relieved the pains of sciatica, neuralgias, as well as other pains, by such application. In applying drugs by this method, if the parts are very tender and sore, use a very gentle current at first, 1 or 2 ma. and gradually increase to 5 as the pain subsides. In sciatica, etc., use 10 to 15 ma., or even more.

Regarding chloroform, while it is chemically the chloride of a trivalent radical formyl, with the formula $CHCl_3$, yet it presents such great resistance to the current that I doubt if it be decomposed in the pro-

[1] Read before the Atlantic County Medical Society, February 3, 1892.

cess of cataphoresis, hence I use it with the anode, A word also as to iodine. In the experiment we were dealing with dead animal tissue; in the living subject we have to do with live tissue, with a cellular structure capable of rapidly assimilating substances brought into proper relation to it, so that the metaloid would not be shown at the other pole when applied to the body, as in the experiment.

In the treatment of the grip I have found that a descending current from a fine faradic coil applied to the spine, from the occiput to sarcum, a most effective adjuvant to other treatment. By a descending current I mean one passing down the spinal cord, the positive being at the base of the brain, and the negative at the sarcum. Use large electrodes and mild, soft currents. I frequently apply galvanism in the same way. The galvanic current has more power in some conditions than the faradic. How does the faradic current relieve pain? If you have a very rapid, smooth current, it does so by partially paralyzing the nerve, putting its molecules into rapid vibration, and preventing them from transmitting painful impulses.

In post-partum hemorrhages the faradic battery, by its great stimulating and contractile power, will often serve you better than ergot or any other agent. Apply in the most convenient manner—one pole over the abdomen and the other in the vagina, pressed well up. No regard need be had to polarity in such cases.

One somewhat common ailment is facial paralysis. In this condition great care is necessary or irreparable injury may be done to the involved nerve. The same may be said of all paralyses in their early stages. Do not use strong currents in Bell's palsy, neither attempt contractions too freely. Generally, such lesion is due to a cold, so to speak, in the nerve, and the treatment is, at first, made as follows, and with a galvanic battery:

Place the anode over the place of exit of the nerve at the ear, and with the cathode at the periphery pass a gentle current, with the nerve, as we term it, or a descending one. Apply once a day if possible, and from five to ten minutes at a sitting. In these peripheral paralyses the reaction of degeneration is shown early, that is, you will not get a contraction of the muscles with the cathodal closure, as in health, so do not attempt it too soon.

In infantile paralysis the same precaution should be observed. Feed the nerve, if the term may be allowed, by descending currents of 3 to 5 ma. daily, with sittings of from five to fifteen minutes.

Myelitis.—In an acute attack, great benefit will be derived by applying the positive galvanism to the spine, and the negative to the abdomen, using large electrodes.

In *Peritonitis*, great relief is given by applying the positive over the abdomen, by a large pad, and the negative to the feet, or some other distant point. The same treatment may be given in severe retching and vomiting, when not due to an overloaded stomach.

Enuresis.—With children, in addition to the use of atropine, apply the negative faradic current to the pubes, and the positive to the lumbar region. In some cases I apply the current to the perineum, and in grown persons frequently make direct application to the sphincter by means of olive bougies.

Sometimes the whole urethral tract will be found in an excessively irritable condition. In such cases, instead of directing irritating, or even supposed soothing injections, I pass an electrode up to the sphincter, having the battery at zero, and then turn on 1 or 2 ma. positive, the negative being on the perineum; then gently and slowly withdraw the electrode, thus acting upon the whole tract. All such instruments must be thoroughly sterilized, and dipped in carbolized glycerine, before being used.

Hydrocele.—Tapping and the injection of iodine is the usual method. My plan of action is by means of this trochar and canula, which is insulated, as you see, with shellac, first washing the parts. Do not draw off the fluid unless there be great distension. Inject a little cocaine into the skin of the scrotum first. After inserting the electrode, attached to the negative pole of a galvanic battery, and the positive being on the thigh, and large, turn on from 15 to 25 ma., and let the current run for fifteen to twenty minutes. Let the patient be in a recumbent position. After the operation nothing is to be done. There will be great distension, but it will rapidly subside, and generally one application will cure. I now have a case on hand of double hydrocele on the same side, and which I fear has recently become complicated by a hernia. The first sac has been completely obliterated, and I expect to reduce the other in the next operation.

Did time permit, I might mention the treatment of indolent ulcers, scrofulous glands, goitres, tumors of various kinds, including cancers, but these must be deferred.

Rheumatism.—If acute and inflammatory, apply the positive current by means of these bandages. Under the first may be placed a layer of absorbent cotton, saturated in a solution of cocaine; the ordinary bandage wetted in warm water, and Walling's bandage of tin foil, fortified by this inner layer of cotton, placed upon the outer side. Commence with a very mild current, and apply for some time. Repeat as often as necessary. The same treatment, without the cocaine, unless there is great pain, may be given in other joint affections, but when the ailment is chronic, like an anchylosis, apply the negative to the joint, and use as strong a current as the patient will bear. Galvanism is here meant.

In opium narcosis I use this brush upon the limbs and body, and as strong a faradic current as is possible to obtain. I consider this a better method than acting upon the pneumogastric.

Lumbago and other myalgias are to be treated with the faradic current, and the parts brought into action by electro-massage.

In all our applications, we must bear in mind that we are acting upon the vital forces by means of one of the most powerful of agents, and be guided by intelligence and good judgment.

"Never tire a patient, and never hurt him," is a most excellent rule to follow.

2009 ARCH STREET.

NOTE ON THE ELECTRO-CONTRACTILITY OF FIBRO-MYOMATA OF THE UTERUS.

By G. BETTON MASSEY, M.D.,
PHILADELPHIA.

THE immediate effect of an electrical application on a myomatous growth of the uterus, has received but little attention from observers, who are naturally more concerned with the after-effects of each application, to which the permanent denutrition and shrinkage is of course due. That an immediate and more or less transitory shrinkage does occur, has been frequently mentioned, and it is, of course, apparent that such shrinkage should depend entirely in degree upon the degree of preponderance of myoma-

tous over fibromatous tissue. The shrinkage is, in other words, a contraction of this muscular tissue itself. The fact that these more or less muscular tumors can be made to give an immediate response to galvanic stimuli is, however, no conclusive settlement of the mooted question as to the existence of nerves within these growths, for the contraction may be due to Hallorian irritability of the muscular tissue. When the stimulus is faradic, on the other hand, the proof of nerve fibers within the neoplasm is conclusive, if such proof is needed in view of the manifest necessity of trophic nerves to the growth and continued life of these higher formations.

I have now under treatment two cases of large myomata which, from their size, situation, and inaccessible cavities, have been eligible to abdominal puncture and percutaneous methods only. In the intervals between the punctures, the cases receive what might be called bi-polar abdominal applications of each current successively, by means of large, flexible pads, placed on each side of the abdominal protrusion. From 150 to 300 milliamperes can be utilized, the higher currents being somewhat painful. This is turned on gradually by the swelling method, and alternated a number of times, after which the primary faradic current is applied in the same way. Considerable contraction and hardening immediately occur, a growth that had been suspected of containing free liquid showing its solidity in an unmistakable manner. The diagnostic value of the method is apparent. As to the therapeutic usefulness of percutaneous applications, I am convinced that they serve a purpose in the intervals of more efficient treatment. I append a list of measurements of the waist circumference of a case under this treatment in association with abdominal puncture. The treatment refers to the external applications.

			Before Treatment.	*After Treatment.*
March	30,	Circumference	41½	41
April	4,	"	40½	40¼
"	6,	"	40½	40
"	19,	"	40¼	39½
May	2,	"	39½	39
"	5,	"	39½	39
"	13,	"	39½	39¼

NOTES OF SOME FIBROID TUMORS TREATED BY ELECTRICITY.[1]

By G. BETTON MASSEY, M.D.

THE following fresh cases of electrical work in fibroid growths of the uterus are brought to your notice because of their intrinsically interesting character, and because also of the fact that they have each been seen by some other member of the profession than myself. Several of these gentlemen promised to be present to-night, and I hope will be able to add the weight of their own observations to mine. The first five cases, which are the only ones to be reported in full, have all had the test of time added at the end of treatment, periods of from three years to three months having elapsed since its termination. The results are all remote, therefore, and are necessarily more valuable as testimony than that of the "wet specimen" reports of cases but recently under treatment, which I will append to this paper.

CASE I. *An intramural solid growth about the size of an adult head that had been causing alarming hemorrhages for years received vigorous treatment for eight weeks; result: lessening of flow during the next six months, at the end of which time a portion of the growth came way, followed by restoration of normal menstruation and health.*—This lady, a physician's wife, aged forty-eight years, was referred to me May 13, 1889, by Dr. Goodell, who will doubtless remember the case well. The tumor was very large, extending much above the navel, was firm and smooth, and evidently a single development in the anterior wall of the uterus, the cavity of the latter being spread out over the posterior aspect of the growth somewhat in shape and size like the cavity in a man's mitten. With a constant tendency toward hemorrhage, and a still greater fear of it, her strength was so reduced that she was unable to leave her room without being carried. She was admitted into my private sanatorium, and during a period of eight weeks received twenty-two applications of the positive pole to the cavity, eighteen of which were between 200 and 250 milliamperes strong. She then returned to her home in a distant State, remaining free from hemorrhages, and with a reduced menstruation for six months, at the end of which time the tumor, or a portion of it, came away as a slough. At the time of making the application I was under the impression that the capsule that presented into the cavity was thin; this portion was doubtless absorbed, releasing the tumor. Recent information received states that the lady is well and menstruating normally.

CASE II. *A small intramural growth that had caused intense menorrhspasms for years, with menorrhagia, received intra uterine treatment for about three months, with moderate currents, resulting in complete symptomatic restoration of health.*—Mrs. E. K., aged forty-four years, was referred to me by Dr. Wharton Sinkler, on the 25th of April, 1890. She had a history of free and painful menstruation since puberty, the periods being of the three-week type. At the age of thirty-two, twelve years ago, the menorrhspasms became worse and she began to swell. She saw Dr. Atlee, of this city, who discovered a lump to the right of the uterus, and instituted medicinal treatment for it. The pain became intense, necessitating the attendance of a physician every three weeks and the administration of powerful anodynes to relieve it. At this time she came under the care of Dr. Sinkler, in consultation with whom she was also seen by Dr. Goodell, the latter employing dilatation and discovering a tumor the size of an orange. In spite of this dilatation, and of vigorous medicinal treatment, the beginning of each period was ushered in by cramps and severe pain that generally lasted from six to twelve hours before the appearance of the flow. The latter continued about two weeks, the first week being free, and was followed by only a week of partial intermission before the pain of another period appeared. When first seen by me she stated that she was getting distinctly worse, as many as four opium suppositories, added to a hypodermic, failing to give relief. She had begun to have a continuous pain in the side.

Owing to the thickness of the abdominal wall the true size of the growth was made out with difficulty, though there could be no question of its existence. Through the courtesy of Dr. Sinkler, the case was brought under the notice of a committee of this Society that has been appointed to inquire into the value of electricity in fibroid tumors, and was examined by Drs. Parvin, Montgomery, Baldy and myself, of the committee, before treatment was begun. Dr. Parvin was satisfied of the existence of a fibroid, but Drs. Montgomery and Baldy reserved decision until

[1]Read before the Philadelphia County Medical Society, May 11, 1892.

an anæsthetic was given, owing to the thickness of the abdominal walls. The following description was agreed upon as a conjoint opinion: A general enlargement of the uterus exists, with projections to both sides; depth of cavity, three and three quarters inches.

April 27, 1890, Dr. Sinkler objecting to the administration of an anæsthetic as unnecessary, Dr. Montgomery re-examined the patient without ether, and expressed his willingness to accept the case as one of fibroid tumor. Treatment was begun by the insertion of a flexible electrode and the application of 35 milliamperes, positive, to the cavity, after which the patient returned on a railroad train to her home in the suburbs. On the way out she was attacked with cramps so severely as to require medical attendance, demonstrating the excessive hyperæsthesia of the cavity. A hastened menstruation followed, and at its termination it was decided that the hyperæsthesia was too great for office treatment, and she was admitted to my ward at the Howard Hospital, where special facilities are afforded for the prosecution of electrical treatment at the bedside. Even with these facilities, the treatment was accompanied by pain and hemorrhage for the first few weeks, after which she was able to return to office treatment. The June menstruation was prolonged, but showed a diminution of pain, and she was enabled to receive 65 milliamperes with comparative comfort. The last application was on July 11, and on the 22d she stated that the menstruation for that month had lasted one week only, that there was no pain, and that no narcotics had been used for the first time in many years. This terminated the treatment sought by her, with the exception of one application in October and one in November of the same year. The August menstruation was normal in duration, without prodromes, and with but little pain during the flow. In September she felt like a young girl, but later had a period that lasted two weeks without much pain. She had also some pain in October, but not enough to bring her back for treatment. Six months later—April 18, 1891—she returned by request, stating that she regarded herself as well, that her periods were natural, five days in duration, and without pain. In February, 1892, the same statements were made to the members of the committee. The last examination was made on the 9th of the present month, nearly two years after the cessation of the treatment, and the permanence of the symptomatic cure verified. The uterus remains nevertheless still enlarged beyond the usual size.

CASE III. *Intramural and subperitoneal multinodular growth, extending to within two inches of the umbilicus and causing retention of urine; treatment by buried vaginal puncture, resulting in relief of all symptoms and reduction of upper limit of growth to four and a half inches below umbilicus.*—This lady was sent to me by Dr. Theodore G. Davis, of Bridgeton, N. J. She was fifty years old, and had been suffering from profuse and irregular menstruation for some time, but the tumor was not discovered until Dr. Davis found it to be the cause of the retention of urine. When admitted to the Sanatorium, October 17, 1890, the uterus was found to be pressed against the pubes by a hard growth attached by a broad pedicle to its posterior aspect, and extending from the level of the os to within two inches of the umbilicus. The other nodule was the size of a walnut and freely movable. The cavity was over three inches in depth. As the bulk of the tumor was subperitoneal, and the lower end was easily accessible through the posterior vaginal vault, the treatment was by buried vaginal puncture, the needle being inserted from one to one and a quarter inches beyond the vaginal surface. The punctures were all negative, and varied in strength from 100 to 150 milliamperes, no anæsthetic being required. In all, ten punctures were made, a diminution in size showing after the second. When this lady was last seen, March 2, 1891, the highest point was four and a half inches below the navel—a reduction of two and a half inches in vertical diameter.

I had hoped that Dr. Davis would have been present to give us the present condition of this patient, as I have not seen her myself for more than a year, but in lieu of his presence he has sent me the following letter:

BRIDGETON, N. J., May 10, 1892.

DR. MASSEY.

Dear Sir:—I had hoped to be able to be present at your meeting on Wednesday night, and will if I can, but I have so many obstetric engagements due just now, that I doubt my ability to do so.

Regarding Mrs. J., I saw her this afternoon, but did not examine her as she is coming up to see you next week. She has, once in three or four months, a discharge of blood, but she has no pain or bladder trouble, is getting fat, and says she feels no hard lump in the abdomen. She adds, "I should have been up to see Dr. Massey ere this if I had not been getting along so well."

If I can come, I will telegraph you.

Very truly,

[Signed] THEODORE G. DAVIS.

[NOTE.—The patient was examined by me six days after the reading of the paper, May 17, and her statement as to an inability to detect the tumor by palpation verified. No growth whatever could be detected by external examination. The bimanual showed only a slight roughness at the fundus.]

CASE IV. *An irregular, multinodular growth, extending one and a half inches above the umbilicus and larger than an adult head, disappears entirely under intra-uterine treatment, leaving a nodule the size of a small cherry on the posterior wall of the uterus.*—The lady in whose case this gratifying result has occurred is a widow, forty-six years of age. She was first seen by me January 31, 1891, having been kindly referred by Dr. G. H. Whitcomb, of Greenwich, N. Y. The growth was at that time one and a half inches below the umbilicus, hard, knotty, and freely movable in the abdominal cavity, in which it mainly lay. In size it was about seven by five inches. Pelvic examination showed it to be continuous with the uterus, the cavity being in the anterior portion, distorted and difficult of penetration; large projections extended to the right and left posteriorly. The patient stated that the growth had been discovered but three years, though preceded by the intense menorrhspasms from which she still suffered. One year before seeing me she had been placed under electrical treatment by Dr. Whitcomb, whose intelligent application of the Apostoli method resulted in great relief of pain, and a reduction of size from one and a half inches above its umbilicus to the same distance below that point. The treatment had been discontinued for some time before the case first came under my observation, but since her removal to Philadelphia there had been a recurrence of menstrual pain and swelling of the tumor, and she was also suffering from an œdematous swelling of the right leg. The examination showed that the posterior projection, which was of a somewhat recent occurrence, probably caused the œdema by mechanically interfering with the venous circulation of the leg.

She was placed on vaginal alterative applications of 150 millamperes, and subsequently on a weaker

intra-uterine method. In three weeks' time she was able to lay aside the elastic stocking that she had been wearing. During the following month, however, a typical attack of the prevailing influenza epidemic put her back somewhat, and I was afforded an opportunity of witnessing an example of the intense menorrhspasms with which she had been afflicted. In intensity the pain was much like that in Case II, but there was also an œdema of the tumor which increased its size most perceptibly. The treatment was nevertheless persisted in, and I had the satisfaction a month later of noting a very great reduction. In August the reduction had so far progressed that Dr. Whitcomb, who had an opportunity of seeing her, reported its disappearance, with the exception of the small projection that can still be found.

The case was examined recently by the writer, and but for an abnormal hardness of texture and the projection from its posterior aspect, the uterus could not be distinguished from a perfectly normal one. The enormous, irregularly lobulated growth had disappeared, making the sixth instance of complete disappearance by electrically-induced atrophy in my experience. The patient menstruates normally, five days at a time, and without pain; showing that the result is not attributable to the menopause. She is now in this city, and I could easily arrange an opportunity for any one to verify the statements made as to her condition.

CASE V. *Intramural growth reaching the umbilicus and complicated by hemorrhagic endometritis and ovaritis; reduction to size of small lemon under treatment; subsequent attack of perimetritis.*—This patient, a nullipara of fifty-two, was referred to me by Dr. Goodell and by Dr. A. W. Knox, the latter of Raleigh, N. C. The tumor was discovered four years before admission to the Sanatorium, and she had suffered much from menorrhagia and menorrhspasms. For one year there had been a continuous dribble. Six months before admission there had been a sharp attack of perimetric trouble, the remains of which, in the shape of tenderness, still troubled her. Examination showed an enlargement of the anterior wall of the uterus that extended to the umbilicus, flattened from before backward. The cavity was three inches in depth and fully two inches wide at the fundus. In spite of the threatening condition of the left ovary, intra-uterine treatment was begun at once, and was very well borne. Between the date of admission, April 4, 1891, to May 27, nine applications were made, varying in strength from 25 to 100 milliamperes, at which time the tumor had receded two inches lower at its highest point. When about to return home, however, the old inflammatory mischief in the neighborhood of the left ovary became relighted and the patient passed through a tedious illness with inflammatory consolidation at that point. During the illness the tumor remained small, and at its termination by apparent resolution, decreased still further in size. A recent letter states that the patient remains well, and that the tumor, though still discoverable, maintains the small size to which it had been reduced.

To these reports of finished cases, which have been selected for special mention because the results have been more or less under the observation of colleagues, I may add brief mention of others, some of whom are still under treatment.

A hemorrhagic, mixed intramural and subperitoneal tumor, in a patient sent by Dr. A. W. Watson, has been relieved and the growth slightly diminished.

An intramural growth the size of a child's head, in a case sent by Dr. Duer, has been symptomatically relieved with some reduction in size. The diminution appeared late in the treatment, and the growth bids fair to get much smaller.

A small, intramural growth, with accompanying areolar hyperplasia, has been reduced in size and symptomatically cured.

Six intramural growths of varying size treated recently in dispensary practice, have been reduced and symptomatically cured.

A large, bleeding, intramural tumor in a young lady of twenty-seven, diagnosed both as a solid ovarian cyst and as malignant, is being treated by abdominal puncture and by bulbous intra-uterine electrodes, with good results in both lessened hemorrhage and reduction of size.

Two cases with small tumors were about to have oöphorectomy performed, on the supposition that there was no tumor and that the trouble was ovarian. Careful investigation revealed small intramural buds in each case, determining the propriety of electrical treatment. Both are now comfortable, and bid fair to get entirely well.

A very large growth, in a patient sent to me by Dr. J. M. Barton of this city, is now being treated by abdominal puncture, as much as 450 milliamperes being passed through the abdominal wall about once a week, without the patient losing a day from her occupation as a teacher in the public schools. This is the largest fibroid tumor yet seen by me. Considerably larger than the pregnant uterus at term, it fills both the pelvis and abdomen, dragging the bladder upward so far as to make it project as a soft tumor in front of the growth. Since the beginning of this treatment the tumor has decreased three inches in circumference.

Before closing I desire to extend thanks to the gentlemen who have increased my opportunities of studying these conditions by referring cases. A recent writer in the *American Gynecological Journal* has made the statement that electricity has few friends among the surgeons of Philadelphia—a charge that I cannot unreservedly pronounce correct, in view of the many private patients received from them. The statement, nevertheless, may have a certain foundation as descriptive of their attitude toward the introduction of the Apostoli treatment into the public hospitals of this city. With the exception of my six months' term at the Howard Hospital, which I have ineffectually endeavored to have lengthened, the scores of well-endowed charities in Philadelphia offer no opportunities for the continuous prosecution of this work in skilled hands, and I have been compelled, in conjunction with Dr. H. R. Bigelow, to maintain a dispensary for this purpose, now located at 412 Spruce street, where deserving cases of this and other affections of women among the poor may receive the benefits of electrical treatment at any time during the year.

DISCUSSION.

DR. WHARTON SINKLER: I do not intend to discuss this paper as a whole, for my experience in this direction has been very limited, but will only speak of one of the cases that Dr. Massey has reported which was referred to him by Dr. Goodell and myself. I unfortunately did not hear the report of the case as given by Dr. Massey, so I do not know what he has said regarding it. Everything depends upon the point of view from which we consider a subject, and the patient's condition may have appeared differently to Dr. Massey and myself. I hope, however, that I have viewed the case in an impartial manner. The patient has been under my care for a number of years. She

has always suffered from violent dysmenorrhœa, with more or less hemorrhage at the periods. Some ten or twelve years ago, Dr. Goodell saw the case with me, and thought that probably the dysmenorrhœa would be relieved by dilatation of the cervical canal. The dilatation was done under ether, and at the operation Dr. Goodell discovered a small fibroid. There was a good deal of pelvic inflammation following the operation, but there was no relief to the dysmenorrhœa. From that time on the menstrual periods were profuse. She was in the habit for years of taking large quantities of morphine at the menstrual periods. About two years ago she was suffering so much that I asked her to again see Dr. Goodell with the view of determining whether an operation was justifiable. She was then about forty eight year of age. He suggested that electricity be tried, and she was then referred to Dr. Massey.

I have here some notes of her condition as given by herself: On February 25, 1892, she said that she was about fifty years of age. Dr. Massey made two applications a week for four weeks, beginning about two years ago, and then one a week for six months, with an intermission of about three months. She generally had a great deal of pain after the treatment, lasting for three or four hours. She always had hemorrhage after the treatment. Since the treatment the periods have been at about the same intervals. She thinks that she has had less pain and has taken no morphine, but has taken considerable quantities of gin, frequently drinking as much as a pint in the twenty-four hours when the pain was severe. She thinks that there is now less hemorrhage. There has been a continual leakage for the past three or four months, and about every three weeks the flow has increased, as if there were a menstrual period; this usually lasts for three days. The last period was February 16, and continued for five days, during which time she was in bed.

I again saw her May 9. She then stated that after the February period there was no flow for six weeks. Then she had a period which lasted three or four days without much pain. Then an interval of three weeks occurred, followed by a period lasting three days; the flow was not excessive, but was accompanied by considerable pain. Early in April she again became unwell, with violent pain and a profuse flow. At this time she took a quart of gin in two or three days. Twenty-eight days after this time she began to menstruate again. The flow and pain were extreme, but this she attributed to the fact she had been on her feet more than usual.

It seems to me that this is not a case that proves very much one way or the other. The woman is fifty years of age, nearing the time for the menopause. While she stated that the pain had been lessened after the electrical treatment, there was still sufficient pain to make it necessary for her to take large quantities of gin. As she was menstruating when I saw her, I could not make an examination to determine the size of the tumor.

DR. MASSEY: It is true that the case referred to by Dr. Sinkler is lacking in some elements of complete success. The tumor is reduced but little in size, but she has, as she told me, but little pain and little flow. I think that this is largely due to the fact that she failed to come for treatment as frequently as she should have done. The unusual pain caused by the treatment led her to discontinue it. She received only two or three applications after leaving the hospital, though she should have been treated steadily for four or five months in order to secure the best results. Still she has been made well enough by the imperfect treatment to get rid of the opium habit; she no longer has the intense spasms which caused her to roll on the floor, and is now leading an active life. I succeeded in getting this patient to go to Dr. Goodell's office two days ago, in order that he might verify the results, but Dr. Goodell was, unfortunately, not at home.

FUNCTIONAL EQUILIBRIUM.

BY ELI CONN, M.D.,
AKRON, OHIO.

THE wheelbarrow with its limited functions for locomotion is but a meager means on which to transport the commerce of the world as compared with the great "iron horse" as he goes snorting through the vales, over the hills, and across the mountains, laden with its human freight, at the rate of more than a mile a minute. So, in the animal kingdom, the single celled animal, whose functions are limited, has but an ephemeral life, and few possibilities, as compared with man, of many functions, whose anatomical constitution is the most perfect, as well as the most complicated mechanism of which we have any knowledge.

How true the saying, when a child is born into the world, "It is a bundle of possibilities." Evolved from the union of two single cells, devoid of specialization, save only the power of response to stimulus, and that of originating action, or automatism. As we ascend higher in the scale of development, while irritability is maintained by all the cells of the body, automatism becomes more and more restricted, until at last it is almost exclusively lodged in that specialized tissue we call nervous matter. The other cells normally act only in response to stimulus of nervous origin, which thus becomes the governing power. The body being an aggregation of cells grouped into organs, each cell having in addition to the sustenation of its own life, a certain function to discharge in the economy of the whole. The nutrition of the body depends first upon the nutrition of the cells, while the nutrition of each cell depends upon its being furnished with proper materials therefor, through the functional activity of some other cell; therefore, not only must the nutrition of each cell be provided for, but it must be kept functionally active, in order that it may do its share toward the maintainance of the others.

"Nutrition," as I said on a former occasion, "ought to be a broad enough term to include not only assimilation (building up of tissue, or anabolism), but also the disassimilation (breaking down of tissue, or catabolism, with expulsion of *débris* or excretion), all of which is a necessary concomitant of function." Function, the *modus operandi* in every organization by which life is maintained, and without which degeneration must come, and life become extinct. Indeed, without function no organic evolution; increase of function, organic differentiation; cessation of function, organic degeneration. This triple law obtains throughout the universe of organization.

Our second point is, that functional equilibrium is, or ought to be, the great desideratum of the physician. The distinguishing characteristic of living things is their ability so to adjust themselves to changes in their environment, or so to adjust some of their parts to changes in other parts, that the general equilibrium may be maintained. This process of adjustment is continuous in every living thing. Just

as the balanced action of centripetal and centrifugal forces serves to keep the planets in their orbits, so the balanced action of constructive and destructive forces serves to maintain the even tenor of life and health. Let either predominate and we have that disturbance, that unbalanced condition, called disease; for balance of function constitutes health, unbalancing is an evidence of disease. Therefore, function at equilibrium constitutes not only the greatest amount of kinetic and potential energy, or force, but also the health or perfectness of every mechanism, as well in the mechanical as in the biological field.

That we may see further the necessity of balanced action let us consider that most intricate, aye, almost miraculous part of man, the nervous system, with its center of centers, the brain with; its mechanism of mechanisms, situate at the center in the intermediate parts and at the periphery, originating action or force here, and inhibiting it there, whose chief function, as a harmonious whole, is the correlation of the vital forces, the moving to action, or the inhibiting of action of the various funtions of the economy. The two great nerve centers, viz.: the cerebro-spinal and the sympathetic must be in harmonious reciprocity, that the varied functions of life may be performed and health maintained. The cerebro spinal moves the body; it laughs the body; it cries the body; and, when unrestrained by the calmative influence of the sympathetic, it may and does put the body in all positions, shapes and contortions, aye, it may make a veritable "jumping Jack" of the body; for instance, the contortions of the histero-epileptic; the spasms of children; the convulsions of tetanus, and the eclampsia of the puerperal state, in all of which states the great sympathetic has been disturbed, irritated or inhibited in some one or more of its varied parts; in a word, the balanced action between the two great causes of functional activity in the organism has been interfered with, or in some way thrown out of balance, and hence the phenomena above described.

Take the nervous mechanism of heat and temperature reaction, which plays so important a part in the maintainance of the life of warm-blooded animals, and which, when disturbed by disease, give rise to the phenomena of fever. Heat is produced in the body, as a result of certain of the necessary functions of life, and also, it is highly probable by oxidation of a certain portion of muscular substance. Some of this heat is converted into work, and has no effect upon the heat of the body; some is dissipated by radiation from the skin, and in the secretions and excretions, especially the excreted air. When neither converted into work, nor dissipated, the heat necessarily raises the bodily temperature, and would subject it to enormous variations, on account of the varying demands of the different organs for work, were it not for a special mechanism which regulates temperature. This regulation is accomplished in two ways—by diminishing the production of heat and by increasing heat dissipation. Hence we have (speaking of center in a general sense) a thermo-genetic, or heat-producing center, which stimulates all those processes, producing heat, and especially oxidation; a thermolytic, or heat-dissipating center, which stimulates respiration, the vaso-dilators, and other mechanisms of heat loss, and a thermo-texic, or heat regulating center, which preserves a proper balance between these two.

Only by the reciprocal balance between these functions can the temperature of the body be maintained. Let either be disturbed, and we have that unbalanced condition called disease—most frequently pyrexia, and why? because the thermo-texic mechanism being a late development under the general law, that dissolution is inverse to the order of evolution. The pyramid topples at the apex, before the base is shaken.

The control, inhibition, or anabolic function is thus diminished, and the thermo-genetic mechanism being unrestrained produces increased oxidation, that is, hyper-catabolism. The result is the wasting of tissues so commonly observed. Graves appreciated these facts from a clinical standpoint when he fed fevers. So in the case of the circulation. It is regulated by a very complicated apparatus, central and peripheral, with intercorrelating fibers, each of which must be kept functionally active, else we will have a blood statis, which is the beginning of all pathology. Functional inharmony of the vaso-dilators, vaso-constrictors, and other mechanisms controlling the circulation results in abnormal, excessive, or defective physiological action. The first point to be determined, then, whether in relation to the disorder of the whole system or to disuse of a particular part, is in which direction the balance of function has been disturbed; whether there is undue preponderance of cell nutrition, building up the individual at the expense of the society; or whether there is undue preponderance of functional activity breaking down the individual, and in this case, as in all others, with loss rather than gain to the society. The great desideratum of the physician is to restore the disturbed equilibrium, and this he does best, who best understands the wonderful mechanism regulating the circulation, and can seize upon some known remedy that will arouse this function, or inhibit that, and yet do no violence to other functions.

But the necessity for functional equilibrium becomes yet more apparent when we consider the varied process of nutrition. Behold the numerous functions at work upon the raw material from the time it enters the mouth cavity until it is finally builded up in unstable molecules, in muscular, ossious, glandular, nervous, and other tissues of the body, there to produce work and force, and again undergoing disintegration by and through functional activity of the various organs of the body. Think of the elaboration of the material as it passes up through, first, the intestinal system or vital reservoir system; second, the lymphatic or vital root system, and third, the vascular or vital trunk system, until it reaches its final destination in the flesh.

The bolus, as it leaves the mouth, having been moistened and mixed with saliva and other secretions, is still crude food. As it leaves the stomach peptonized, it is soluble food. As it is absorbed by the villi having been emulcified by mixture of the bile and pancriatic juice, it is liquid food. After passing the lymphatic glands, it is vitalized food. After passing into the veins and through the portal system, it is crude blood plasma. And after passing through the lungs, it is purified blood plasma. By this natural miracle of transubstantiation the bread is made flesh. This change is fearful and wonderful if we simply contemplate it. Natural and admirable, scientific and not less wonderful if we observe, test, measure, and weigh it.

This humble mouthful of bread, to fulfill the order of its being, to carry out the veritable purpose for which it was created, and complete the great metabolical cyele, must pass through twelve or fourteen processes, *viz.*, prehension, mastication, insalivation, deglutition, peptonization, emulcification, fermentation, absorption, vitalization, purification, circulation, assimilation, disassimilation, all of which is accomplished by and through the nutritive functions. To

maintain these functions—aye, the varied functions of the whole organism at equilibrium, is the great end or object of the scientific physician. So these six thousand years and longer, for aught we know, he has been skirmishing around, having the innate desire to be a benefactor to the race, in the fields of empiricism and theory, watchful at all times, ready to seize upon the faintest glimmer of light, coming from whatsoever source, only that he may *know* the the real *cause* of diseased action, and find a remedy that will restore the disturbed functions, without any violence to the organism; yea, more, that will seize upon some one or more of the occult processes going on in the organism, and assist that inherent tendency of life, confirmed and organized throughout all the ages of evolution to restore the disturbed balance of forces, to bring about an equilibrium of function. This, gentlemen, is the great work of the physician. Keep the functions of the body in harmonious reciprocity—a proper giving and taking of the materials in the metabolism of the tissues, as the cycles of *constructive* and *destructive* metamorphoses chase each other from the cradle to the grave, let each—and the one is as important as the other—function be maintained at equilibrium, and we have a normal or healthy organism. But break this equilibrium, intercept or destroy this functional reciprocity, by whatever mode or means, vicrate but a single cell, and you have a cause for diseased action which, if not restored to functional activity, must inevitably end in disaster to the whole organism.

Society Notes.

NEW YORK ACADEMY OF MEDICINE.

SECTION IN PEDIATICS.

Stated Meeting May 12, 1892.

DR. W. P. NORTHRUP, Chairman.

A CASE OF RANULA

WAS presented by DR. J. LEWIS SMITH. The child was twenty months old, and the ranula was noticed soon after birth. It did not interfere with nursing, but was beginning to produce a deformity, causing the mouth to open, giving the characteristic frog-like expression. The child did not talk, although of ordinary intelligence. Development was somewhat retarded, and for three months there had been no increase in weight. The tumor was double, occupying both sides of the frenum, and apparently very vascular. Large vessels could be seen radiating over the surface. Two operations were available. One consisted in passing a silver wire around and through the mass, so as to obliterate it by causing inflammation. The other was excision of a portion of the growth, but, owing to its extreme vascularity, serious hemorrhage was to be feared.

DR. S. BARUCH thought the danger of hemorrhage was not great, and favored the excision of two-thirds of the mass.

A CASE OF MICROCEPHALUS

was presented by DR. HENRY KOPLIK. The patient was four months of age, and was the sixth child. The head was very small, and the anterior fountanelle was open, but the sutures were closed. There was distinct left facial paralysis, and upon touching the lower jaw it moved with a spasmodic jerk. The legs were deformed from lack of development of the peronei muscles. The reflexes were increased, and there was also spastic contraction of the fingers. Nystagmus was observed, but was not constant, appearing only when the child looked toward the left. The probable condition present was microcephalus with congenital retarded development of the cerebrum, with involvement of the pyramidal tracts. The question of a Lannelongue operation was a very important one. The speaker believed that the nervous symptoms indicated lack of brain development, and that nothing would be gained by operating on the skull.

DR. W. M. LESZYNSKY believed that the Lannelongue operation was a very serious one. He had recently seen two fatal cases. In the present case he did not believe that an operation upon the skull would aid the brain, which was evidently an undeveloped one.

The subject of discussion was

SUMMER DIARRHŒA IN CHILDREN UNDER TWO YEARS.

The first paper, entitled

RELATION OF THE STOOLS TO THE LESIONS AND TO PROGNOSIS; NERVOUS SYMPTOMS AND THEIR ORIGIN,

was read by DR. HENRY D. CHAPIN. When the disease is located in the two extremities of the alimentary canal, the stomach and the lower segment of the large intestine, the discharge will quite surely locate for us the seat of the trouble. In the intermediate tract, however, it is usually difficult to judge with certainty either the extent or location of the lesion by the character of the stools. A classification that can be made only upon post-mortem examination is of but little value clinically. The following is a fair clinical classification, and includes the vast majority of our cases:

1. The diarrhœa of acute indigestion.
2. The diarrhœa of inflammation.
3. The diarrhœa of chronic indigestion or atrophy.

In the first the stools consist of fæcal matter, soon becoming thin and watery, and containing particles of undigested matter, consisting chiefly of lumps of fat and undigested caseine. If these undigested masses continue to be passed, the stools soon contain more or less thin mucus. If starchy food has been given, it may be passed unchanged in appearance. In general, the passages in acute indigestion consist of undigested and fermenting food and the products of an irritated mucous membrane.

There is a point where irritation, if unchecked, becomes inflammation, and the second form of diarrhœa is developed. It is difficult here, as in other places, to always distinguish that point. When well developed, the temperature will remain elevated. The passages, if milk is the food, will contain masses of fat and lumps of curd. If milk is stopped and meat-broths are given, the passages usually become darker colored, and contain very offensive feculent matter. Mucus in various conditions soon becomes a prominent element. If colored with bile segment, it is an indication of jejunal or iliac catarrh, and is usually accompanied by undigested food. The closer the mixture of the mucus with the fæcal masses the nearer is the lesion to the cæcum. When the lower colon is most involved, the mucus will be more distinct, passing in glairy masses, or sometimes in pulpy, shreddy particles, presenting the appearance of false membrane. Blood, if mixed in streaks, comes from

the ileum or upper colon; if free and red, from the lower colon or rectum.

White, dryish, putty-like stools consist principally of fermenting fat; brownish stools of albuminous matter from animal broths, frequently very offensive from advanced decomposition. The yellowish, watery stools are simply the ordinary fæcal discharges diluted. The causation of green stools has been a subject of much controversy. However caused, they are clinically noticed in connection with much irritation of the bowels with active fermentation of their contents.

The presence or absence of ulceration cannot be determined with certainty from the character of the passages, but when there is rapid loss of vitality out of proportion to the number and character of the stools, ulceration is to be suspected.

The most persistent form of diarrhœa and most difficult to treat is that resulting from chronic indigestion and atrophy. Putty-like stools alternate with green mucus, or brownish offensive discharges. Assimulation becomes more and more defective and the child dies from exhaustion. The underlying trouble is defective vitality, not inflammation, and antiseptics and astringents are useless.

The nervous symptoms accompanying summer diarrhœa are numerous and often serious. Impoverished blood passing sluggishly through the brain will account for some of them. It is probable, however, that as a rule those symptoms are due to irritation produced by toxæmia. Such toxæmia may be caused by the absorption of ptomaines resulting from fermentation in the bowel. The brain symptoms thus produced often disappear upon thoroughly clearing the bowel.

Uræmic poisoning is also responsible in some cases for brain symptoms and death.

CONDITIONS INDICATING CHANGE OF AIR AND BATHS IN THE SUMMER DIARRHŒA OF CHILDREN

was the subject of a paper by DR. SIMON BARUCH.

The removal of the cause of disease being the chief aim of modern therapy, the insanitary conditions which actively contribute to the development and maintenance of summer diarrhœa becomes an important element.

A change of air is not demanded by reason of any special difference in the proportion of oxygen or other chemical constituent, but rather to avoid two sources of error:

1. A high temperature and marked humidity—one or both.
2. The presence of impurities.

Whenever treatment seems unavailing and prostration and intermitting fever are present, the question of change of air becomes important. Of what avail are stimulants, tonics and food when the little sufferer is forced to toss under the constant oppression of a stifling atmosphere, especially if there be also an excess of moisture. Rich and poor alike are crushed under this terrible combination. Removal by a rapid and comfortable journey to a high altitude or to the sea-shore, free from these prejudicial conditions, becomes imperative in many cases. The change in the entire aspect of the case is too well understood to need comment.

Among the well-to-do classes atmospheric impurities are rarely operative in summer, though imperfect ventilation often breeds them in winter. In the tenement districts of large cities, however, this is an active factor. In these noisome tenements, in which the children of the poor and many even of the better classes of working people, are huddled together, the elements which contribute to the development and maintenance of summer diarrhœa find an excellent place for their culture and propagation. The elements demanded in the prevention of this disorder are clean food taken into a clean stomach and its detritus removed through a clean intestinal tract. It is to obtain these conditions, not more oxygen, that a change of air is demanded. The work carried on by the St. John's Guild is deserving of the utmost commendation. To the poor this change from the filth-laden atmosphere of the city to the pure breezes of the harbor comes as a refreshing and vivifying blessing that cannot be over-estimated.

One point in this connection must be noticed. While of the utmost importance in the tenement districts, it is not always so important where the conditions are more favorable for home treatment. The change from a comfortable home to a country hotel, often overcrowded, is not to be advised without careful reflection. The benefits accruing to the little patient do not always warrant the expense, anxiety and disturbance of family resulting from a sudden removal of a child without due preparation when the symptoms become alarming. The advantages and disadvantages should be carefully considered. We should see that the milk is sterilized, that the colon has been irrigated, and that all measures have been tried before advising a change.

The lessons derived from a long experience at a summer resort are two:

1. While all cases of summer diarrhœa of infants living in crowded homes demand change of air, treatment is, at least, equally important.
2. Among the better situated, change of air need not be insisted upon until all approved methods of treatment have been fairly tried.

Bathing for cleanliness is always demanded in summer diarrhœa, both for the purpose of cleanliness and by maintaining the functions of the skin to relieve intestinal congestion. For therapeutic purposes baths are especially indicated in acute cholera infantum, for they offer more positive relief and contribute more to cure than all other measures. In this condition we find hyperpyrexia, though the extremities and face may feel cold and clammy.

Whenever the temperature exceeds 102° F. a cooling procedure is indicated, and it is important that the proper method of bathing be observed. The child should be placed at full length in a tub of water at 90° after the face and head have been bathed with ice water. Gentle friction should be constantly applied, while some one is removing with a pitcher the tepid water and replacing it with ice water. The temperature of the water is thus gradually lowered to 80°. If cerebral symptoms are present, water at 60° should be poured over the head and shoulders. The bath, with friction, should be continued fifteen minutes, unless cyanosis of the face or decided shivering appears.

The latter is prevented by active friction. After the bath the child is placed on a linen sheet lain smoothly on a blanket. If the temperature before the bath was 103.5°, or over, it should be wrapped and allowed to dry, if under that it should be dried and the clothing replaced at once. It should be understood that the object of the bath is not primarily to reduce temperature, although this is an important incidental result. We have here a vaso-motor paralysis as evinced by the pallor of the skin when the rectal temperature is high. This condition is counteracted by the bath and friction as described. The

effect of a skilfully administered bath in such conditions of nerve prostration must be seen to be appreciated.

In the sub acute forms of summer diarrhœa the chief condition indicating baths is the general depreciation of the system arising from the great drain upon the blood and nerve tone. We here have the symptoms of chronic adynamia. To stimulate the appetite and improve the general nerve tone should be our endeavor. The most improved tonics often fail. In those cases general ablutions morning and evening are preferable to baths. The child is placed on a soft woolen blanket, and the abdomen, chest and back are rapidly bathed, not sponged, as follows: From the hollow of the hand water at 70° F. is poured upon the skin, which is then gently rubbed with the same hand. The body is rapidly dried, and friction with a rough towel is employed if the temperature is below 99.5°. If the temperature is above 102° a general bath is indicated.

THE USE OF DRUGS IN DIARRHŒA; INDICATIONS FOR ALKALIES, ACIDS, ASTRINGENTS AND OPIATES.

DR. J. MILTON MABBOTT read a paper upon this subject. Much clinical and experimental effort has been expended in recent years upon that much vaunted class of drugs, the antiseptics and antizymotics. It was early inferred that it would be difficult to find an antiseptic capable of internal administration in doses sufficient to kill microbes without proving poisonous to the patient. Baruch, five years ago, referred to the large quantity of antiseptic necessary to sterilize so extensive a surface, and Vaughan showed the feeble inhibitory power upon the tyrotoxicon producing germ of all the antiseptic drugs. Holt has pointed out that by reason of absorption the soluble antiseptics cannot reach the lower bowel where the chief trouble lies. But insoluble drugs in a fluid menstruum have very weak antiseptic power. It is probable that the action of bismuth is due more to its astringent and soothing properties than to its antiseptic power. It seems impossible at present to administer antizymotic drugs by the mouth in such a way as to influence materially the small and large intestine. We are obliged to admit that they have been tried and found wanting.

Nevertheless, the bacterial studies of the disease, especially those of Booker, have taught us to secure asepsis where we cannot apply antisepsis. They have also made clear the rationale of certain drugs, especially cathartics. Stimulants, though locally undesirable, are at times necessary, and sedatives may be required to relieve pain.

Until recently, there seems to have been general consent to the administration of alkalies. But, now that we endeavor to promote asepsis and control fermentation by evacuant, dietary and hygienic measures they are certainly less important than formerly. They are usually given with or soon after feeding. When using pepsin, alkalies should be given midway between feedings.

The indications for acids are doubtful. Lactic acid, as proposed by Hayem, is advocated in (1) acute infectious diarrhœa where the stools are numerous, watery and often foul, but yellow in color, and (2) in green bacillary diarrhœa, for which it is recommended as a specific. Numerous observers have found the reaction of the alimentary canal in healthy infants acid throughout, and Pfeiffer has shown that green stools are associated with alkalinity. Hence, the use of acids would seem to have a rational basis. The dilute mineral acids are commended by many, the dose being one to five drops, administered twenty minutes after feeding. The vegetable astringents have, during the last few years been almost discarded. The same is true also of mineral astringents with a single exception. That exception is bismuth, the subnitrite being the preparation universally esteemed. It is prescribed in much larger doses than formerly, twenty grains every two hours sometimes being given to an infant.

Opiates are less used than formerly. They undoubtedly check peristalsis. As peristalsis is increased in diarrhœa, this action is desirable after the bowels have been emptied of their objectionable contents, but highly dangerous before. The other indications for opium are the relief of restlessness, pain and tenesmus and the control of frequent watery passages. Ashby and Wright recommend it in the latter stages if the passages continue small and numerous. Holt and Crandall always prescribe the opiate separately, so that it may be conveniently increased, diminished or withheld at will for increasing fever or toxic symptoms call for its discontinuance. It should not be given when the passages are infrequent and of bad odor. A decrease in the number of stools while they become more offensive, contra-indicate its use and demand evacuants. Relief of pain is one of the highest duties of the physician, and, unless definitely contra-indicated, sufficient opium should be given to accomplish this.

FEEDING, STERILIZED FOOD, GENERAL FEEDING

was the subject of a paper by DR. HENRY KOPLIK. A number of cases were reported in detail, which tended to show that while some infants taking an artificial food show no traces of sugar in the urine, there is a considerable proportion which do show this abnormal condition. On the other hand, infants taking rationally prepared milk or mother's milk, showed no trace of sugar.

Although numerous theoretical reasons may be given against the use of sterilized milk, clinical experience proves that it is better tolerated by the stomach than any other artificial food. It has a peculiar taste, but infants soon develop a liking for it, and prefer it to other milk.

At the Good Samaritan Dispensary, during the summer of 1891, milk was sterilized on a large scale. Six bottles, containing 4 or 5 ounces of milk, were given to each patient, the sum of eight cents being charged. In this way over 40,000 bottles were distributed to 575 different infants. The results were favorable in the extreme. The chief drawback was inability to control the milk before receiving it at the dispensary. Changes that have already taken place cannot be remedied by sterilizing. Milk that appears to be good when cold will often prove unfit for use when heated. Milk that is several days old may show no signs of change, but when boiled will promptly curdle, owing to the formation of lactic and other acids.

When sterilized it will appear flocculent, and should be rejected, as it is positively dangerous. It is also impossible, in New York, to obtain milk less than twenty-four hours old, and much of what is used is several days old, and has been preserved by means of ice and chemicals.

To obviate certain changes which takes place in milk sterilized at high temperature, an attempt has been made to destroy the activity of the germs by subjecting it to a lower temperature.

In Boston, Dr. Rotch has accomplished this at a temperature of 167° F., but the milk used is usually

fresh and pure. Another method recently proposed is that of bringing the milk quickly to the boiling point, and then placing it at once in a cool place. While milk thus treated keeps much longer than ordinary milk, it should be distinctly understood that it is not sterilized.

Resterilization, by repeatedly subjecting milk to a high temperature, is not to be commended. Milk is a very complex fluid, and every disturbance of its elements renders it less desirable as a food. Our aim should be to produce as little change as possible. If, therefore, it can be rendered safe by heating to a less degree, it should be done. This process of heating milk to a temperature of 167° F., and cooling it quickly, is now known as Pasteurization. It does not actually sterilize the milk, but renders inactive certain ptomaine-producing germs. Such milk will keep several days, and as at this temperature, it is but little, if any, changed in its constituents, it presents an improvement over the older form of sterilized milk.

DR. J. LEWIS SMITH asked Dr. Koplik how long he would subject the milk to heat in the process of sterilizing. Before sterilized milk was known, he had been in the habit of directing the milk for the child to be subjected to the heat of boiling water for two hours, but now advises but twenty minutes.

DR. KOPLIK replied that after twenty or thirty minutes, when the Arnold sterilizer is used, the hood could be removed.

The Chairman referred to the formula proposed by Dr. Blackader, at the recent meeting of the American Pediatric Society, the Arnold apparatus being used: A pint of water, a Bunsen burner, and fifteen minutes. The hood may then be removed and the cover left ajar. This is effectual for Pasteurization.

DR. A. JACOBI objected to the statement that he has written extensively on infant's foods "pro and con." He had never written anything in their favor, but had always opposed their use. Sterilized milk was an improvement on the methods he had formerly adapted. It was a great error to suppose that sterilized milk was anything but cow's milk. It required just as much modification as though it were not sterilized; a good food was not one that was simply tolerated, one upon which a child did not die, but rather one upon which he would thrive. Many an invalid owed his ill-health later in life to improper feeding in infancy.

Alkalinity in cow's milk was always suspicious, for it was evident that it had been "doctored." The most dangerous alkali was bicarbonate of soda, for in milk thus treated the ptomaine producing germs developed best.

While pepsin was sometimes useful, the speaker objected to its discriminate use. Without an acid it was inert. The best remedy referred to during the evening was irrigation of the colon. Not only did it remove decomposing matter, but burnished fluid, which was so much needed; for some is absorbed.

DR. S. BARUCH said he had not prescribed pepsin without acid for ten years, and had not administered it to children for five years.

DR. JACOBI said still further that sugar was required in artificial food, but he did not believe that milk sugar was best. There was a close relationship between milk-sugar and lactic acid. The change from one to the other was very rapid. Some lactic acid was necessary for proper digestion, but an over quantity produced hyperacidity and indigestion.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON ORTHOPÆDIC SURGERY.

Stated Meeting, April 15, 1892.

HENRY LING TAYLOR, M.D., Chairman.

DR. L. A. SAYRE said that in his paper at the last meeting, he had referred to a case of hip disease which he had seen in consultation with Sir James Paget and Mr. Adams, of London, which it was generally considered could not recover without ankylosis and deformity. He was fortunate in having the opportunity of presenting this patient at this meeting. This man could place the feet on a table, could squat down, and, in fact, could perform every motion so well that it was difficult to see which had been the diseased hip.

THE EFFECT OF PERSISTENT MOTION.

DR. JOHN RIDLON exhibited a girl, nine years old, who had come to him at the Vanderbilt clinic on April 23, 1891. Eight months previously she had received an injury to the right elbow, which was diagnosticated as a "fracture of the coronoid process of the ulna, and a dislocation backwards of the radius and ulna." She was attended by a well qualified practitioner of this city. The arm was immobilized for about four weeks, and then passive motion was commenced. Twice daily the forearm was flexed and extended on the arm to the limits of tolerance, and twice weekly, under an anæsthetic, the forearm was flexed and extended to the normal limits of motion. This treatment was faithfully continued for seven months, during which time the range of motion gradually became more restricted, the joint more and more swollen, and more painful under the attempts at motion. Examination showed the forearm flexed on the arm to a right-angle, much swelling about the joint, enlargement of the superficial veins, and atrophy of the muscles of the arm and forearm. The swelling had a pulpy feeling, but no point of fluctuation could be detected. The bony points were so obscured that the exact nature of the injury could not be determined. There was no motion at the joint, and attempts at motion caused pain, and developed intense muscular spasm.

The treatment adopted was as follows: The head was bent down, and the wrist put in a "halter" made out of a roller bandage knotted around the wrist and neck. The slack of this was taken up as the rigidity yielded, and at the end of two weeks the joint could be completely flexed. In this position the joint was held without motion being once permitted or tested for eleven months. The pain disappeared, the swelling gradually subsided, and when the halter was removed there was found to be free, painless motion, from a right-angle to normal flexion. Since then there has been no treatment, and the range of motion in the direction of extension is gradually increasing.

DR. W. R. TOWNSEND said that this girl had been brought to the Hospital for Ruptured and Crippled about two years ago by her attending physician, who said that passive motion had been made under ether about three times a week since the fracture to prevent ankylosis. Dr. W. T. Bull, who saw the case in consultation, agreed with the speaker in advising rest. The attending physician dissented from this view, but finally said he was willing to give the joint rest for a limited time, if he were relieved from all responsibility as to the result. The case was accord-

ingly treated in the hospital with a plaster of Paris splint for about four weeks, when the mother objected to a continuance of this treatment. Dr. Bull again saw the case in consultation, and the opinion was then expressed that there was a beginning osteitis, and that if motion were kept up the child would undoubtedly have a stiff elbow. The patient and doctor dissented again, and wished passive motion made, so she was then discharged from the hospital out-patient department.

DR. S. KETCH said that if the arm were moved beyond a certain point, especially in rotation, there is reflex spasm, and he thought there was still some active disease in the elbow joint. He asked if the halter allowed of prenation and supination.

DR. RIDLON replied that the halter did not prevent these motions, but so far as his experience with it had gone, when properly applied under the clothes, the children, as a matter of fact, do not attempt to make these motions.

DR. RIDLON also presented a case for diagnosis.

A man, thirty-four years old, came to him at the Vanderbilt clinic on February 15, 1892. For two weeks he had been stooping, and stiff in the lumbar spine, with pain in the back and lower abdomen, and, at times, down the front of the thighs. Seven years ago he had a similar attack, at which time, after suffering for four weeks, he went to the dispensary of an orthopedic institution in this city, where the diagnosis was made of Pott's disease, and a Taylor spinal brace applied. He remained in bed for two months, wearing the brace, but without any relief. He was then admitted to the St. Francis Hospital, where a blister was applied, and the pain immediately relieved. At the end of two weeks he was quite well again, and remained so up to the present attack. Examination revealed the whole lumbar spine curved backward and rigid; there was psoas contraction on the left side, but none on the right, and there was a doubtful fullness in the left iliac fossa. He was treated with antirheumatic remedies, and soon showed improvement, and in the course of a few weeks felt entirely well. There is now no spinal curvature, no rigidity, no psoas contraction, and the patient is quite well, except that at times, after long sitting over a bench at his work, he feels the back somewhat stiff.

AN INEXPENSIVE HEAD SUPPORT.

DR. ROYAL WHITMAN exhibited a support which he had devised for a child with mid-dorsal disease, in whom there was a tendency for the shoulders and the whole body to droop forward. The support consisted of a curved piece of steel attached to the back of the brace used in connection with lateral pads for holding the shoulders back, a form of apparatus which he had already exhibited and described.

DR. V. B. GIBNEY then exhibited a series of operative cases.

ANKYLOSIS OF THE HIP AFTER TYPHOID FEVER.

The first case was that of a boy, eleven years of age, whose trouble dated back to an attack of typhoid fever in November, 1889. He was admitted to the hospital July 14, 1890, and at that time, his general condition was fair; there was a long and deep cicatrix over the right hip. There was about half the normal motion. The left hip was held flexed at 135°, and there was much spasm. His mother died of phthisis, but the other members of the family were healthy. One month later, the right limb could be extended to 180°, and the left limb to 170°, with little or no motion at the knee. He was then allowed out of bed, wearing a brace on the left side, and a high shoe on the right. On November 19, there was some tenderness around the joint, but none in the joint. The brace was left off, and he was given cod-liver oil and allowed to walk around. On January 16, 1891, the right thigh was flexed on the abdomen. The adhesions were broken up by manual force, and in doing so a "snap" occurred. The tensor vaginæ femoris and the fascia were divided subcutaneously, and the deformity yielded visibly. The limb was then hyper-extended, abducted and rotated outward, and put up in plaster of Paris. On February 11, as the thigh was flexing, the limb was placed on an inclined plane with a weight and pulley, and this treatment was continued for nearly one month. The left hip was then extended at an angle of 158°, with practically no motion, and the right hip at 170°. On June 13, the right thigh could be completely extended; the left to 140°. On October 23, under ether, it was found that the hip could not be fully extended, so the tense bands attached to the anterior superior spine were divided, and then the limb almost completely extended, and put up in plaster of Paris. On January 18, 1892, he was etherized, and a femoral osteotomy performed, and the limb hyper-extended and put up in plaster, and by February 17, there was firm union, the limb was extended at an angle of 175°, and with 5° of motion. The ordinary hip splint was then applied. On March 5, the limbs were parallel, union was very firm, and his general health was good. On April 6 he was allowed to walk about without any support.

EXCISION OF ONE HIP IN A CASE OF DOUBLE HIP-DISEASE, WHERE SACRO-ILIAC DISEASE WAS FIRST DIAGNOSTICATED.

The next case, a boy, nine years old at the time of his admission on January 22, 1890, had a good family history, and his hip disease was attributed to a fall in September, 1889. Before coming to the hospital he had been treated in a dispensary for sacro-iliac disease. At the time of admission, the thigh could be flexed to 60°, and extended to 180°; all the movements were restricted by pain. On March 4, 1890, both thighs and knees were flexed, and there was much reflex spasm about the right hip, and somewhat also about the left. The hips and knees were extended, and the limbs made parallel, and they were then put up in plaster of Paris spica. About this time the temperature began to rise to 102° every night, and to fall in the morning to 98.8°, and there was marked tenderness in the right hip. On March 29, there was fullness and deep fluctuation in the upper fourth of the thigh, and a needle withdrew some pus and blood. A hip splint was applied, and the child put to bed. On April 8, a double spica, with traction, was applied. On September 3, about 7 ounces of pus were removed from the right thigh by aspiration, and on the 30th of the same month, the child was etherized, an old sinus curetted and enlarged, and a counter-opening made. The head and neck of the femur and the acetabulum were found to be diseased. The temperature remained high until October 15, 1890, when a large abscess was found over the trochanter major, which did not communicate with the sinus. On January 28, 1891, after poulticing, the abscess opened spontaneously. On February 10, the child was etherized and excision performed. The head and neck were curetted, a counter-opening made, and a double spica applied. The dressings were changed every third or fourth day, peroxide of hydrogen solution being used to wash out the cavity. By July 2,

the excision wound was almost completely closed, there was some infiltration about the joint, but very little spasm and tenderness, and the limb could be extended to 180°, and flexed to 160°. By September 16, flexion had been increased about 10° in the right limb, and the left limb could be extended to 180°, and flexed to 135°, motion being slightly restricted by spasm. On December 16, a jointed splint was applied, upon which he walked around with comfort. On February 27, 1892, it is noted that there is a fair amount of motion at the right hip without pain, the other limb remaining unchanged since last note.

EXCISION OF HIP WITH FAIR RESULT, SCARCELY FINAL.

The next case was a girl, who was eleven years of age at the time of her admission on June 6, 1889, with hip disease of six months' duration. Her mother had died the previous year of some pulmonary affection. The child was poorly nourished and could hardly stand; the right limb could be flexed to 135° and abducted one fourth of an arc, and the left correspondingly abducted; there was marked tenderness and spasm. On July 31, 1889, a small quantity of pus was removed by aspiration, and the hip splint was applied. On December 9 of the same year, the limb was much abducted, and there was some infiltration in the upper part of the thigh. On May 13, 1890, the hip was very acutely inflamed, and the child had night cries, and tonics and stimulants were ordered. On December 2, there was very little discharge and the wounds looked healthy. On February 12, four sinuses were discharging freely, and there was considerable burrowing of the pus. On April 24, 1891, excision was performed, involving three of the sinuses. The capsule was practically gone, and the head of the bone carious, and there was a shell of exfoliated bone. After dividing the bone at the neck, it was found that the disease extended into the shaft, so 1 1-2 inches were removed, and the parts thoroughly curetted, packed and drained. On July 18, the child was etherized, and some sinuses again scraped out. On July 27, there was 10° of motion, and the limb was extended to 170°. By August 20, there was scarcely any discharge, no tenderness, the limb could be extended to 180°, and there was 20° of motion. On February 18, 1892, it was noted that the angle of greatest flexion was 100°, and the greatest extension 180°. There was no spasm or pain on manipulation. At present, she is wearing a caliper splint, the right thigh can be flexed nearly to 90°, the abduction is quite good, and extension is nearly perfect.

CASE FOR DIAGNOSIS—PROBABLY SUBACUTE RHEUMATISM.

A little boy was next exhibited, who had been sent to the out-patient department of the hospital about three weeks before for a diagnosis. For three months he had complained of pain and stiffness in the hips and knees. He had the walk of hip disease with slight spasm, and slight limitation of motion, and it was a question whether there was really incipient hip disease, or whether there was a neurotic element in the case. He was given the salicylates internally. Soon after, he began to complain of pain in the knees and ankle, while the hips had improved slightly. He had been in the hospital only two days, but in this time there had been some improvement. There was evidently pain, and undoubtedly also an inflammatory process, as on several occasions his temperature reached 101 or 102°.

ATONIC KNOCK-KNEE; FAILURE TO RELIEVE BY APPARATUS; SUPRA-CONDYLOID OSTEOTOMY; SUBSEQUENT SYNOVITIS; LATER STILL, APPARATUS. RESULT, VERY UNSATISFACTORY.

The fifth case was a girl who first came to the dispensary on January 1, 1888, when fourteen years old. She then had right knock-knee, which was treated with a Thomas knock-knee splint. The brace was worn for about one year, and then was removed, and the shoe built up on the inner side. On August 5, the knee had again become relaxed, and plaster of Paris was applied. On October 21, there was a synovitis of the right knee, and the girl was admitted to the hospital shortly afterward. At this time, both knee-joints were relaxed, and could be hyper-extended; there was flexion to about 120°. The knee-joint was distended with fluid, and there was some joint tenderness. On November 14, 1889, about twenty ounces of clear fluid were drawn from the joint, which was then irrigated with carbolic acid solution, 1.40, and the limb put up in plaster of Paris. On January 30, 1890, there was again some effusion into the joint, and she walked with some stiffness. There was flexion to 140°. On February 27, she was discharged unimproved, and on March 31, she was readmitted. At this time, there was marked lateral improvement, the tibia could be abducted so as to make an angle of 153° with the femur, and abducted to 175°; the knee could be flexed to 110°. There was also much pain in the muscles about the right hip and thigh, and considerable tenderness in the iliac glossa, with prominence just in front of the great trochanter. On September 18, 1890, the pain had disappeared from the hip, and she was wearing a Knight posterior knee-brace. She was discharged from the hospital then, but again admitted on May 27, 1891. Finally, a supracondyloid osteotomy was performed from the outer side, and the knee over-corrected, and put up in plaster for awhile. At present, she is wearing a splint without motion at the knee, and although she walks well, there seems to be no prospect of improvement.

"SOME OF THE INDICATIONS FOR OPERATIVE INTERFERENCE IN ORTHOPEDIC SURGERY."

A paper with this title was read by DR. V. P. GIBNEY.

The paper dealt first with the range of orthopedic surgery as held by the majority of surgeons practising this specialty throughout the world. It commented on the brilliant results obtained by general surgeons in many cases that were strictly orthopedic. It emphasized the importance of supplementing operative procedures with mechanical appliances.

It was suggested that orthopedic surgery might be advanced if one devoted as much time to the clinical history and the pathology of the disease which produces deformity, as one does to the devising of splints and modifications of splints. The importance of devising splints to suit individual cases and to meet certain conditions was regarded as an important part of orthopedic surgery.

It was stated that the orthopedic surgeon seldom has an opportunity of putting a splint on a case in the very first stage of the disease; that many of the cases of what are called early hip disease were not early cases, but that deformity had already arisen when they came to mechanical treatment. The same was true of Pott's disease of the spine.

Some of the indications for operative interference were mentioned as correction of deformity in these

early hip cases by manual force under ether, by divisions of tendons and muscles, if the correction were difficult, and in the advanced cases, where the disease was fully arrested, osteotomy below the trochanter minor was suggested as a valuable addition to our therapeutics.

With regard to abscesses, it was urged as good orthopedic surgery to make incision if four or five aspirations failed to relieve. It was further suggested that old sinuses and pockets of pus should be treated by operative interference.

Operative interference in spinal disease was not recommended except where a severe trauma had fractured the lamina, and where pressure had resulted. In these cases, laminectomy was advised, but it was suggested that in many instances of this kind, the ordinary mechanical treatment proved of valuable service.

In disease of the knee, partial arthrectomy was advised in preference to complete arthrectomy or to ex cision, especially in children. In the internal derangements of the knee, operative interference was advised rather than the prolonged use of apparatus and fixation splints. In synovial disease, pure and simple, an occasional aspiration of the joint, with strapping, was regarded as good orthopedic surgery.

DISCUSSION.

DR. L. A. SAYRE said that the paper covered too broad a field to admit of discussing it in detail, but in general, the author had expressed his own views most accurately.

DR. JOHN RIDLON did not consider that the element of time was very important, except in those exceptional cases where it was a difference between a few weeks and several years. On the principle of leverage, he had been able to reduce the deformity in some of the very worst cases of hip joint disease, in a few hours, or a few days, as safely by mechanical means as by operation. It was only the question between a few days following an operation, and a few days more with mechanical treatment; and, under these circumstances, we should not think of doing a cutting operation. In all cases of disease of the hip or of the knee, leverage reduction will accomplish the result as well as operation.

DR. S. KETCH said that while theoretically the orthopedic surgeon should be a good general operating surgeon, in practice, he is not frequently called upon to perform operations, and hence, could not be expected to be as skilful manually as surgeons who are constantly operating, and on this account, a natural division of labor was founded. He inferred from the paper that the author must have met with a class of cases in which it was unusually difficult to reduce the flexion, for, as a rule, there was no special difficulty about reducing this deformity, provided sufficient time were allowed. Forcible leverage or stretching adds an unnecessary risk, as there is no way of accurately gauging the amount of force employed, and hence there is danger of inflicting traumatism, which will result in lengthening the course of the disease, and causing a speedy return of the deformity.

DR. W. R. TOWNSEND thought there was one class of cases in which mistakes are likely to follow mechanical treatment, but which yield brilliant results after operation, viz., the so called periarticular abscesses. Such an abscess, situated outside of the hip-joint, often gives rise to symptoms simulating hip disease, and if not treated by operation, there is great danger of the abscess opening into the joint.

DR. D. W. HUBBARD endorsed what Dr. Ketch had said about the treatment of deformity in the early stages, and he had found in his own experience, that the reduction was usually quite rapid. He had never seen a case of hip disease in any stage, where there was motion, in which the deformity could not be reduced by position and traction in a short time, usually not over six to eight weeks. He could not see the force of the remarks just made about periarticular abscesses, for they are just as likely to open externally as internally, and, as a rule, they heal quickly without operation.

DR. H. W. BERG said, that had it not been for careful attention to mechanical details, such important orthopedic appliances as the plaster jacket, the long splint, and the Taylor brace would not have been known, yet orthopedic surgery should be broad enough to include within its scope both mechanical and operative treatment.

DR. N. M. SHAFFER thought that many of the conditions described should necessarily come under the care of the general, and not the orthopedic surgeon. We are all agreed, however, that the orthopedic surgeon should be competent to perform all the operations of general surgery, just as he should be able to diagnosticate typhoid fever or the exanthemata, etc. But it does not follow that, because the orthopedist is prepared to perform these operations, or to diagnosticate the diseases coming under the care of the physician, that he should do either the one or the other, unless circumstances made it absolutely necessary for him to do so. Dr. Shaffer would have orthopedic surgeons devote themselves to the science and art of the mechanical treatment of deformities, using operative surgery as an adjunct to the mechanical work, rather than, as many of us are prone to do, make the mechanical part a sort of kite-tail to operative surgery. There is so much to be learned, and so much to be developed in the continually broadening field of mechanical treatment, that there seems to be no excuse for the present tendency of orthopedic surgery to invade the well recognized boundaries of general surgery. The tendency ought to be the other way, if orthopedic surgery is to succeed as a specialty.

DR. R. H. SAYRE said that orthopedic surgeons should be competent to take charge of a case from the beginning to the end, whether it required mechanical or operative treatment. Limiting orthopedic surgery to the use of apparatus, is like limiting the oculist to the application of glasses for the correction of refractive errors.

DR. ROYAL WHITMAN said that he was unable to see the force of the application of Dr. Shaffer's remarks on the paper of the evening. A specialist was so by reason of the class of cases he treated, not because of the means he employed. The broadening field for this specialty was the study of the etiology, development and cure of deformities; the study of the course, complications and ultimate results of joint diseases. Treatment must vary with the social environment of the patient, the severity and duration of the disease or deformity, and the most successful surgeon was the one who could best adapt the means to the end to be accomplished.

Early diagnosis and efficient treatment would, to a great extent, obviate the necessity for operation, and it was proper for one who could select his cases, to devote himself exclusively to mechanical treatment. On the other hand, many chronic and desperate cases of disease and deformity were brought to the institution with which he was connected. These patients would

be neglected at home and rejected at general hospitals. Mechanical treatment alone in this class was ineffective, unless supplemented by operation, which was often a necessary and a life-saving procedure. This exaltation of mechanics was opposed to the best interests of the patients, since, in the minds of many, mechanical and operative treatment, which are mutually dependent, were contrasted and opposed to one another; thus patients, on the one hand, were subjected to early and unnecessary operation, and afterwards neglected, and, on the other, the benefits of legitimate surgical interference were not appreciated. Why a broader, and as it seemed to him, more rational view of the subject need prevent the study and appreciation of mechanical supports, was not apparent. Believing that disease was to be treated in its entirety, and not in phases, he was unable to accept the limitations that Dr. Shaffer would impose on the future development of orthopedic surgery.

The Chairman said that if the orthopedic surgeon must be familiar with operative methods, as undoubtedly he must, he must also be a competent neurologist, for just as serious mistakes would follow ignorance of this subject, as ignorance of operative surgery. Certain limitations are naturally placed upon one's practice depending upon whether it is private, or dispensary, or hospital practice, for, in the latter, it is often not the best ultimate result, but the best that can be obtained within a limited time, or with limited means, that must decide the plan of treatment to be adopted. The author's directions in regard to the reduction of the deformity in joint disease, and especially in certain stages of hip disease, while perhaps successful with him, would be exceedingly dangerous if followed by the general practitioner.

Dr. Gibney, in closing the discussion, said that the great drawback to letting the general surgeon operate upon our cases, is that we frequently lose sight of them, and they are accordingly allowed to go without the use of protective apparatus, and that careful treatment after operation, which is necessary in all these cases to insure a good result.

OBSTETRICS AND GYNECOLOGY.

By E. S. McKEE, M.D.

AMPUTATION OF THE BREAST FOR MALIGNANT DISEASE.

THIS was the title of a paper read before the Kentucky State Medical Society at Louisville, Kentucky, by H. Horace Grant.

There is a wide diversity of opinion on the subject of this paper, a large majority of surgeons favor the radical operation, while some of the ablest believe in palliative steps and partial removal. There are three objections to radical operation; the uncertainty of diagnosis; the increased mortality when the axilla is invaded; the probability of early recurrence. As to the first, under certain circumstances, hesitation is to be observed, but an exploratory incision can add nothing to the gravity of the non-malignant condition. After forty years of age all removable tumors of the breast should be excised without regard to diagnosis. There is but one danger left us under the second objection, that of shock, unless by accident some injury be done the great vessels of the axilla. In a recent paper, Dennis, of New York, reports 71 cases of complete removal of the breast with but one death. Dr. Grant himself has removed the breast and opened the axilla without accident, and almost without shock nine times in private practice within the past three years. As regards the recurrence of the disease Dennis gives as the influences of recurrence:

1. The age of the growth.
2. The extent of infiltration.
3. The completeness of the operation.
4. Histological character of the carcinoma itself.

We have certain and early death without operation; accurate and early diagnosis in doubtful cases by incision; safe and reassuring aid by complete operation; a most encouraging hope of cure in one-third of all cases. Early and complete operative steps are demanded to secure such results, even in most favorable looking cases. The operation must be radical to the extreme as it is impossible to tell the amount of infiltration or lymphatic involvement. At the inner angle of the wound a granulating surface heals with great ease, and cutting away freely may be done. It is best to completely remove the skin under which the cellular tissue is infiltrated, even with inflammatory products. All fascia and all infiltrated muscle, even to the ribs, should be cut away, with resection of the bone if invaded. When infiltration and ulceration are considerable, it is imperative to make an incision circumscribing all possible disease. The subscapular vein should be tied before division, there will then be no hemorrhage unless the muscles are divided, even the axillary vein has been resected when found diseased. The wound should be irrigated with 1–1,000 hot bichloride, and then washed out with 1–3,000. A short drain should be put in the axilla and brought out through a counter opening. The axilla should be closed, if the inner part of the wound cannot be covered it should be left to granulate. The tubes should be removed in forty-eight hours unless otherwise indicated. The best material for suture is silk worm gut, next reliable cat-gut. Tension sutures of large silk are appropriate sometimes. The iodoform and gauze dressing is to be applied. The arm should be bound loosely in a sling. If the resulting cicatrix looks unhealthy, or if the wound fails to heal, it is unwise to be in haste to operate, as such conditions often ultimately recover. The patient may be allowed to be up about the fourth day if she does ordinarily well.

Dr. G. E. Jones reported a case of

ABDOMINAL SECTION FOR MULTIPLE FIBROID OF UTERUS,

and showed specimens at the Cincinnati Obstetrical Society.

DISCUSSION.

Dr. G. S. Mitchell said he had been present at the operation, and had previously examined the patient, and confirmed diagnosis of fibroid of the uterus. The operation was rather prolonged, though but little blood was lost. The greatest difficulty was in getting pedicle up and transfixed before cutting away the tumor. The peritoneum was separately united by cat gut sutures, and held to peritoneums of the pedicle by the same means, the lower angle of womb where the stump was dressed externally.

Dr. E. A. L. Reed said that he desired to congratulate Dr. Jones on the success of the operation, but did not believe the method followed to be the best one. In the plan adopted in this case the pedicle must be allowed to suppurate externally, although he had shut off the abdominal cavity by stitching the peritoneum to stump at its point of emergence. He did not believe in any operation which provides any tissue to be disposed of by sloughing.

The speaker believed that the entire uterus could have been removed and the vaginal roof closed by

sutures after its complete removal. He thinks the entire removal is sometimes very difficult, but that the relative merits of the intra and extra-peritoneal treatment of the pedicle. He thinks the entire uterus should be removed when fibroid disease of the organ is treated surgically, although he thought many other means of treatment more valuable, and should be employed before resorting to the knife in all cases of uterine fibroids.

The doctor supplemented the report of a case to the Academy of Medicine in which he had removed the uterus by the new method, stating that the patient had suddenly died on the eighth day, prematurely, from hemorrhage. He believed, in the absence of an autopsy, which was denied, that one of the ligatures had slipped off the broad ligament, under stimulus of some violent muscular movement on the part of the patient.

DR. C. D. PALMER said he had done supra-vaginal hysterectomy for fibroids of the uterus on two occasions, one successfully and one unsuccessfully. He distinctly recalls the prolonged and animated discussion on this subject, as to the modes of operation in cases of this kind, which occurred in New York city, at a meeting of the American Gynecological Society, in September, 1889. Dr. Bantock, of London, took the position that the extra-peritoneal method was the more desirable, while Dr. Martin, of Berlin, favored the intra peritoneal method. Without doubt, the Koeberle method has given better results, the world over, than the intra-peritoneal technique, but it is very tedious, painful and unsurgical in results. The intra-peritoneal is more surgical, although he admits the increased dangers of hemorrhage and septicæmia. He was very favorably impressed with Dr. Krug's report of cases. He now believes that if an operation on these tumors is made, provided they are non-pediculated and sub-peritoneal, that the whole uterus should be taken out to the vaginal junction, in preference to all other operations, as Koeberle's or Martin's. But these operations are to be only a *dernier resort*, after failure of the operations of nature, judicious medication, uterine curettement, the Apostoli treatment, etc. When abdominal section is made for a growing interstitial or extra uterine fibroid, with uncontrollable hemorrhage and pressure symptoms, the following points are to be considered:

1. Will an oöphorectomy promise good results?

2. Is the growth pediculated, and removable as an ovarian cyst should be?

3. Is the growth purely interstitial or sessile? If the latter, remove the whole tumor with whole uterus, with patient in Trendelenberg position.

DR. R. B. HALL believed the entire removal of the cervix after the section, and removal of the fibroid tumor, to be the correct method, and would soon be the recognized plan in all these cases. He had made supra-vaginal hysterectomy by Koeberle's method several times, and the new method once only, but he was decidedly in favor of the latter plan.

DR. GUSTAV ZINKE agreed with a previous speaker in the main. He had seen several operations done on the plan just mentioned, by Prof. Chrobak. The uterus exposed, it is seized with a strong pair of volsellum forceps and lifted as far out of the abdominal wound as possible. The broad ligaments put upon the stretch are first ligated by three sutures, running along a line below the tube and ovary from the outer margin to the uterus. The appendages are then removed with scissors above the point of litigation. He then makes a careful circular incision around the womb, dividing the peritoneal coat on a level with, and a little above the bladder, and with the aid of his thumb nails or the handle of the scalpel, dissects it off until he has reached the cervico-vaginal junction in front and behind the tissue containing the uterine artery and vein on either side. The latter is then ligated and cut close to the point of insertion into the cervix. One of his assistants then introduces into the posterior cul-de sac the hysterectomy staff. With the aid of this instrument fixed behind the cervix, the posterior fornix is pushed up and the operator penetrates the vagina from above, cutting with the knife along the groove of the instrument. The removal of the uterus is now a comparatively easy matter; by repeated small cuts with knife or scissors the vagina is severed from its junction with the cervix, breeding points being ligated according to necessity. An "iodoform wick," the thickness of a finger and the length of the vagina, is then introduced into the vagina from above, and folds of the peritoneum, secured from the uterus attached over it, thus separating the vagina completely from the peritoneal cavity. All the cases seen had recovered promptly without complications.

DR. RUFUS B. HALL reported a case to the Obstetrical Society of Cincinnati, and showed specimens of

TOTAL EXTIRPATION OF THE UTERUS FOR LARGE FIBROID TUMOR.

Mrs. B. W——, aged fifty years, well-nourished and in fairly good health, excepting that she suffered severe pain, which has increased from a mere discomfort some six months ago, to a constant, severe pain at the present time. The tumor filled the pelvis and the greater part of the largely distended abdominal cavity. It was irregular in outline with one large mass extending to the right upper part of the abdominal cavity and weighed twenty two pounds. The operation was made February 4, 1892, at the Cincinnati Free Surgical Hospital for Women. The patient has known of the tumor for about twelve years. At the operation it was found that the only portion of the tumor which was not adherent was a space of about six inches square, directly in front. All the upper half of the tumor was covered over with omentum which was adherent to the tumor and the abdominal wall, and was so much damaged that it was removed. The most difficult adhesions, however, were intestinal upon the upper and back part of the tumor, which we were obliged to separate without the aid of sight before the large mass could be turned out of the cavity. The adhesions in the pelvis were so extensive that a temporary clamp to control bleeding could not be applied until the tumor had been delivered. The patient therefore lost a large quantity of blood before the temporary clamp could be utilized.

While separating adhesions in the pelvis, an abscess cavity was opened up and a pint or more of pus turned out. The pus cavity was outside the tumor proper, and as near as could be determined from the specimen, it was a pyosalpinx, but the specimen was so torn it was impossible to say positively.

After the bulk of the tumor had been cut away, and the broad ligament had been tied, the work of total removal of the cervix was the next procedure. The vagina was first opened behind the cervix, and by careful stitching and ligating around the cervix it was soon removed entire, as you see in this specimen which I present. The ligatures were left long and brought out through the vagina, but the after-management of the case has convinced me that the ligatures should be cut short. The patient recovered and

left the hospital the sixth week. For more than five years I had believed this to be the rational and correct method of operating for large fibroid tumors, and have discussed the matter in private with my friends engaged in this work, but I did not have the courage of my convictions and make the operation until this case, though other operators have done so. I am convinced that total extirpation in these cases in an operation which has come to stay, and the clamp in hysterectomy will soon be a thing of the past, as certainly as it is now a thing of the past in ovariotomy.

57 WEST SEVENTH STREET, CIN.

LEPERS PROOF AGAINST ELECTRICITY.—"Down at Honolulu," said Harry Diamond, "I had a battery and worked the innocent Kanakas with the old trick of the five-dollar gold piece. That is, I'd place the piece in the bottom of a jar of water connected with the battery. Then I'd tell the native boys that they could have the money if they'd pick it out of the jar and hold the handle on the other pole of the battery at the same time. Of course the moment their hands struck the water the circuit was completed, their fingers would be doubled up and they couldn't touch the money if their fortunes had depended on getting it. I had many a laugh and achieved quite a reputation among the boys as a wizard who controlled the devils in the water.

"One day when several young ladies were in the office a lad came in, pushed on by a number of companions who had attempted to secure the five dollars and failed. He had been persuaded to try for the money, and I explained the trick to the ladies in an aside as I arranged the apparatus. The boy took the handle, and we all prepared for a great laugh.

"He put his hand into the water, slowly drew out my fiver, and quietly walked off with it, while I stood with my mouth open, afraid to face those girls, and praying for a volcanic eruption to turn the trend of thought.

"The boy had the leprosy, and the electricity didn't affect him."—*San Francisco Examiner.*

TREATMENT OF TABES DORSALIS.—Leyden (*Berl. klin. Woch.*, 1892, Nos. 17 and 18), first refers to the drugs most commonly employed. With regard to mercury, he would not oppose its use, but he rejects altogether the syphilitic origin of the disease. Many of the cases which have got well under mercury have been examples of peripheral neuritis. The treatment by baths sometimes yields good results. Electrotherapy is, in the author's opinion, a valuable method of treatment, but massage can have but little effect. Leyden does not believe much in suspension, nor in nerve stretching, nor yet in the orthopædic treatment. He lays considerable stress on what is called the compensatory treatment of this disease, namely, that when the disease is incurable, the disturbance of function should be minimized as much as possible. In tabes dorsalis the ataxy is one of these disturbances, and this may be in great measure compensated by the use of gymnastic exercises. The very valuable paper by Fraenkel (*Münch. Med. Woch.*, 1890. No. 52), on the use of these graduated exercises in disordered coordination is referred to. Under the head of complications the pains and gastric crises are chiefly alluded to. The author cautions against the indiscriminate use of morphine. The loss of weight often occurring rapidly if the gastric crises last long, must be counterbalanced by good feeding in the intervals. The avoidance of overexertion, exposure to the weather, and excesses of all kinds is naturally insisted on.

AMMONIA FOR ELECTRIC SHOCK.—An ingenious dentist has been making some interesting experiments with animals which have been nearly killed by electric shocks.

On Wednesday he was standing on the street and saw a sparrow in a small pool of water left by the street sprinkler. The bird soon went up and flew to a wire overhead. The shock at once sent him to the ground, where he lay until the dentist picked him up, barely able to move his wings. The gentleman breathed into the sparrow's mouth and let him go. As the shock was not a very bad one, the bird was soon able to fly, but he again returned to a dangerous locality, and the result was another shock much worse than the first. When the bird fell to the ground he was apparently lifeless, but the dentist took him to the office and began an experiment.

He at first resorted to artificial respiration as before, and then injected in the bird's flesh aromatic spirits of ammonia, and poured a few drops diluted with water down the sparrow's throat. He then put him in a dry closet and gave him some clear water after a few minutes. When placed in the closet the bird's body was nearly cold, but the treatment proved so effective that in less than an hour he was able to fly as well as ever and was liberated.

—*Daily Eastern Argus.*

NEW ANTISEPTICS.—Among new antiseptics from coal tar derivatives, says S. A. Walton, may be mentioned pyoktanin, methyl-violet, the most antiseptic of the aniline colors. A solution of 1 in 1,000 is used in various eye diseases, phthisis, ulcers, etc. There is a yellow variety commonly known as auramine, also used antiseptically.

Lysol is a saponified phenol derived from cresols, and contains the higher homologues of carbolic acid. It is said to possess higher antimycotic power than carbolic acid, and to be less poisonous. This preparation is much used in Germany at the present time.

Retinol, a destillation product of pine resin, is a viscid fluid hydrocarbon. It is a non-irritating and stable antiseptic.

Europhen, iso-butyl ortho-cresyl-iodide, contains 23 per cent. of iodine, and is non poisonous.

Dermatol, a basic gallate of bismuth, forms a powerful antiseptic and dessicant.

Sulphaminol, thio oxydiphenylamine, the antiseptic action of which is due to its decomposition, in contact with the fluids of the body, into sulphur and phenol.

Monochlorphenol is prepared by the action of chlorine on cooled phenol. It is a powerful antiseptic and less irritating than trichlorophenol.

Camphoid, though only a mild antiseptic in itself, is a valuable adjunct to this class of bodies, as it forms a ready method of applying antiseptics to the surface of the skin, and owing to its composition (of spirit, camphor and pyroxylin) it forms a valuable solvent for substances such as salicylic acid, resorcin, hydronaphthol and many others.—*Scientific American.*

DR. NICHOLAS has been appointed by the Health Board to succeed Dr. Michon in charge of the Riverside Hospital. Dr. Michon, who has been acting resident physician of North Brother Island since Dr. Percival resigned, has been made a vaccine physician under Dr. Roberts in the Bureau of Contagious Diseases.—*Doctor's Weekly.*

The Times and Register

A Weekly Journal of Medicine and Surgery.

WILLIAM F. WAUGH, A.M., M.D., Managing Editor.

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INVESTMENTS FOR PHYSICIANS.

A GOOD general rule in regard to investments is that one should place his funds in enterprises about which he can form an opinion, because they relate to his own business or profession. When one puts his money into a thing of which he has no practical knowledge, he runs about as good a chance of losing as does the man who never handled the reins, but buys a horse on his own judgment, aided by the arguments of the man who has an animal to sell.

Further than this, by investing in matters having some connection with his own business, one can use his personal influence in their favor. The code of ethics prevents the physician who is a member of societies, as all should be, from engaging directly or indirectly in the manufacture or sale of drugs; but there are other avenues open to him. There is the field of medical journalism. Most of our journals are supplied by publishing or trading houses, and are more or less influenced by their ownership, to the detriment of professional interests. There is no special reason why physicians should not own medical journals. The success of THE TIMES AND REGISTER is principally due to the fact that it is owned by a number of physicians, each of whom is interested in its prosperity. The ideal journal should be the property of a company of physicians, with representatives in every large city in the country, each one actively engaged in collecting and forwarding papers, news, etc., from his own section. This would render the journal a cosmopolitan publication; it would have no local limitations, and would probably wipe out of existence most of the trade journals. So many advantages would accrue to a journal thus constituted that it seems singular no one has founded it.

Another opening for the physician's funds is to be found in the development of mineral springs. We all know that we can prescribe for our patients the European spas with as much precision as we do our drugs; but that there is a good deal of uncertainty in regard to the American springs. Because the latter are in the hands of non-professional persons, who advocate them as panaceas, on the general principle that the waters will cure anybody who has money enough to buy them, no matter what is the ailment. How much better it would be for all concerned, if physicians were to become, individually or as stockholders, the proprietors of these remedial agents, and *preconise* their true uses and their limitations. Accurate information as to the cases best suited to each would vastly increase the proportion of visitors benefited, and thus win the public confidence. No better recommendation of a water could be made than the assurance of the physician that he had invested his money in the spring; and it can hardly be objected that he would be likely to take a commercial view of the matter, and send every one to his own spring, as no one knows so well how certainly such a course would result in injury to the reputation of the water.

A third professional investment is in the sanitaria, or special private hospitals. People everywhere want special treatment, and are willing to pay for it. The opium or alcohol habitué will go any distance to obtain what he believes to be the best treatment for his ailment. The world is ransacked for spots where the consumptive may live a little longer. The asthmatic seeks relief on the shores of Puget; the rheumatic betakes himself to Southern California; the emphysematous to Minnesota, and so on. Physicians are bewailing the overcrowding of the profession, the difficulty of collecting, the inroads of competitors, and yet the most lucrative opportunities lie unnoticed at their feet.

It is the old story. Easier to drift along, ambitionless, in the old rut, never lifting the eyes to look out of it, than to put into one's *business* that enterprise and energy that are the birthright of every American.

THE EXAMINATION FOR RESIDENT PHYSICIANS AT BLOCKLEY.

THIS examination has been completed, and the result is as follows: Fifty-seven candidates presented themselves, of whom thirty-nine were from the University of Pennsylvania, six each from Jefferson and from the Woman's Medical College of Philadelphia, five from the Medico-Chirurgical College, and one did not give the name of his *alma mater*. Four failed to reach the grade rendering them eligible. Of those who won the approval of the Board, the first twenty-two stand in this order:

1.	Dr. D. Riesman, U. Pa.,	grade.....	90.3
2.	Dr. Schamberg, U. Pa.,	"	86.9
3.	Dr. Greenwald, Woman's,	"	85.7
4.	Dr. J. H. McKee, U. Pa.,	"	85.6
5.	Dr. N. D. Steel, Medico.	"	85.6
6.	Dr. T. Augè, U. Pa.,	"	85.
7.	Dr. A. M. Davis, U. Pa.,	"	84.8
8.	Dr. L. E. Curry,	"	84.7
9.	Dr. R. L. Pittfield, U. Pa.,	"	83.4
10.	Dr. W. H. Carpenter, U. Pa.,	"	83.3
11.	Dr. A. H. Stewart, Jeff.,	"	83.3
12.	Dr. A. C. Macdonald, U. Pa.,	"	82.9
13.	Dr. W. G. Craig, Jeff.,	"	82.9

14.	Dr. Prefontain, U. Pa.,	grade.....	82.5
15.	Dr. Lucas, Woman's,	"	82.1
16.	Dr. J. E. Talley, U. Pa.,	"	82.1
17.	Dr. W. R. Weiser, U. Pa.,	"	81.9
18.	Dr. W. J. Scott, U. Pa.,	"	81.7
19.	Dr. Robertson, U. Pa.,	"	81.3
20.	Dr. W. M. Reedy, Jeff.,	"	81.3
21.	Dr. W. Seaman, U. Pa.,	"	81.3
22.	Dr. J. Zimmer, U. Pa.,	"	81.3

The average of all the candidates from each college was:

Jefferson Medical College.....	79.6
University of Pennsylvania.....	78.8—
Woman's Medical College	76.3+
Medico-Chirurgical.....	76. —

It was the unanimous opinion of the Board of Examiners that the papers were the poorest that had ever been submitted to it; the deficiency being noticeable in the professional acquirements, the grammar and spelling, and in the carelessness with which a number of the papers were prepared. It is difficult to account for this, as the appointments have heretofore been made strictly in accordance with the findings of this Board, and its members are assured that no change is contemplated in this respect. It has always been the policy of the Board to make the questions as simple and "easy" as possible, to avoid the danger of hitting a subject concerning which a student might be ignorant, although well-informed in other respects. It would seem that no one could plead misunderstanding of questions so elementary; and yet there was not the slightest difficulty in grading the merit of the answers.

This condemnation must be qualified by calling attention to the honorable position taken by the representatives of Jefferson College. While but three appear among the first section, the grade of all her representatives was the highest of any of the colleges. This was not altogether due to the lack of competition. It was the impression of the writer that there was a general improvement in the scholarship of the Jefferson men; showing that the changes in her teaching have been beneficial. The general average of all the candidates is a better test of the efficiency of a teaching institution, than headship in a class; as the presence of a few exceptionally bright men may win the latter, when the methods of instruction are inferior; while the absence of any very poor specimens indicates a good system and careful weeding out of incapables. But we wish that this generalization had been made from more than six candidates.

It will doubtless be claimed that the best men did not apply for this examination; and there may be some truth in this, as many other hospitals held their examinations earlier, and secured their choice of the applicants. But as this is the only hospital examination in the city in which no allegation of partiality can possibly be made, and as this hospital presents the greatest opportunities for study of any, it is to be presumed that each school sent up the best material at its disposal.

We expect to present in future an analysis of some of the answers.

THE *Evening Telegraph*, of June 1, has an article concerning the examinations for hospital appointments, written with the strong University bias for which that sheet is noted. The University is credited with forty-nine appointments out of sixty; including in the list the Presbyterian, German, St. Agnes,' St. Mary's, St. Joseph's, Mercy and West Penn of Pittsburgh, Cooper of Camden, Polyclinic, Howard, Children's, Wilkesbarre, St. Luke's, Bethlehem and Philadelphia. It is not stated whether there were any applicants from other colleges at all these contests, or whether the examinations were held by boards representing equally the contesting schools. It is *assumed*, that when applicants from other colleges did not present themselves, it was on account of the confessed superiority of the University men; but, it is well known that students generally *believe* that a contest is hopeless in institutions where University influence preponderates. Both these factors operate, and both must be given credit; the well-merited confidence of University men, and the distrust of the examining boards in some hospitals by the men from other colleges. Granting that the examiners are impartial and honorable men, there must be an advantage to the candidates who have been taught by the examiners; and this hardly needs demonstration. Students learn what a teacher considers important, and what he will be likely to ask. Teaching necessarily differs as to certain points. One of the Blockley examiners teaches that a pleural effusion changes its place with a change in the position of the body; while another makes this a point of distinction between pleural effusion and hydrothorax; claiming that the former soon becomes confined to its original site by inflammatory adhesions gluing together the opposing surfaces at the margin of the effusion. Thus, each would mark his own student in accordance with his own teaching; and the same answer would be a miss with one and a hit with the other. It is no reflection upon the examiners that we claim that no board can be impartial unless the contesting colleges are equally represented.

The results of these examinations are too honorable to the University to require any of the dexterous shifting of figures in the remainder of the *Telegraph* article. An attempt is made to discredit the *Ledger* account which gave the averages made by *all* the *candidates* of each school, as given also in another page of this journal. Those figures were strictly correct and gave the best idea of the standing of the schools. The writer can scarcely be accused of partiality, as the school which he represented on the board stood at the bottom. But the *Telegraph* takes the average of the twenty who stood highest, and from their marks figures out a triumph for the University, average, 84.03, over the Jefferson, 82.5, and the Women's, 83.9, *leaving out the Medico-Chirurgical altogether, whose average was 85.6!* Purely accidental, no doubt. Why not just as well take the averages of those that failed altogether: three University men and one Medico? Or of the last twenty, who were equally representative of their schools with the first twenty? Of the last twenty the Jefferson average was 75.2, Women's, 73.46⅔, University, 72.68⅓, and Medico, 72.

As the sailing rate of a fleet is determined by that of its slowest member, so the requirements of a college are to be determined by its worst representative; and the University has the honor of leading the procession and of bringing up the rear; six of her men ranking below the lowest Jefferson; and the last one tieing the lowest Medicq for last place, not being above him, as the *Telegraph* has it. Another inaccuracy appears in our lay cotemporary's carefully worded article: The University men were numbered 10 and 12; the Jefferson, 11 and 13; these being ties in which, according to a rule of the Civil Service, the candidate who first filed his application receives the highest rank.

We have taken the trouble to go into this matter in detail, because to this board has been entrusted the task of protecting the rights of these candidates; and no attempt to make capital for any institution at the expense of justice, will be permitted to go unanswered.

—W. F. WAUGH.

Annotation.

WE intended to present to our readers this week an "Orthopedic Number;" but have been compelled to postpone it, owing to the delay of several contributors who had promised us papers too valuable to be omitted. As soon as these are in our hands we will issue this important special number.

In place of it, we present you a number principally devoted to Electricity; a specialty in which all physicians are interested, and concerning which all desire information from those most skilled in the use of this agent. Dr. Murray contributes some interesting observations on the absorption of drugs under the influence of electrical currents. Dr. Goelet, Dr. Walling and Dr. Massey are too well known to our readers to need an introduction.

Letters to the Editor.

A SIMPLE INHALER.

A YEAR or two since, whilst attending a young lady dying of consumption, I was sorely put to, as we often are, for means to alleviate her distressing cough without using drugs likely to harm in other directions. I found the following simple plan of considerable benefit: Removing the rubber bulb from an ordinary eye-dropper, I inserted into the dropper a small pledget of cotton previously dipped in oil of eucalyptus. In addition to this, a small amount of dry cotton was pushed into the tube, in order to prevent the oil from being drawn into the mouth. She was directed to "smoke" with this little inhaler whenever she felt like coughing, and, although of course the cough was not entirely stopped yet it was without a doubt considerably alleviated. Since that time I have suggested the use of this simple instrument to a number of others troubled with coughs of various character, and have been much gratified at the results. I am fully aware that there are inhalers to be bought, made somewhat after the same plan, though less crude; but other things being equal, an instrument that can be made almost by a turn of the hand, and with practically no expense, is to be preferred to one that necessitates money and a visit to the instrument store.

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ELECTRICITY IN MENORRHEGIA.

HAVING met with no obstacles in the management of our electrical apparatus, and, notwithstanding, we have treated a number of cases, seventeen in all, with very gratifying results, both to ourselves and patients, we have as yet met with nothing sufficiently unique or novel to merit publication.

The most satisfactory case we have had the pleasure of treating was that of Mrs. D., aged thirty-five, mother of two children, aged respectively, five and two and one-half years, who suffered an abortion last September, which resulted in subinvolution, with profuse uterine hemorrhage, which confined her to her bed from September to the following January, at which time we were called to see her. We learned, upon inquiry, that she had been subjected to almost every manner of treatment, consisting of ergot, belladonna, hamamelis, cannabis indica opium, acetate lead, Gallic acid, the mineral acids, iron, quinine, strychnine, singly and combined variously, as internal remedies, and locally she had been tamponed, curetted, ice to spine and elsewhere, iodine, iodized phenol, nitrate of silver, solution of persulphate of iron, and many other things, diluted and full strength, had been applied to the endometrium, and was of no avail; the woman still bled. She was never a day without a show, and every one to two or three weeks she would turn loose and bleed in torrents to syncope, which she did time and again.

Upon examination, I found all the genitalia extremely relaxed and flabby, indeed, her whole system was one of extreme anæmia and debility. The sound entered the uterus five and one-half inches.

Began treatment January 5, intra-uterine faradic application five minutes, which had the very happy effect of controlling hemorrhage at once. January 7, intra-uterine galvanic, positive pole, 40 ma., three minutes. January 10, same as above, 60 ma. for three minutes. January 13, positive intra-uterine, 45 ma., three minutes. January 20, positive intra uterine, 30 ma., three minutes. At this time the uterus was found to be of normal depth, with no hemorrhage after the first application. All medicines were discontinued from the first application; and with none other than good regimen, the patient went on to the rapid recovery of her wonted good health and employment. She menstruated normally six weeks from the beginning of the treatment, and has continued to do so every month since. I met her yesterday, in the very bloom of health.

This case has been the means of us getting many others. She was attended by half a dozen of the best physicians in town before she fell into our hands.

A. W. TERRY, M.D.
DENISON, TEXAS.

The Medical Digest.

ELECTRICITY IN RHEUMATISM.—In acute articular rheumatism electricity in any form is of doubtful value. In any event, it is very difficult to make satisfactory applications to the inflamed joints and sensitive muscles.

While general and local palliative treatment may give great comfort to the patient, and may occasionally prevent complications, it is yet doubtful whether an attack of acute rheumatism can be much shortened by any method of treatment. I have, however, seen unmistakable evidences of the benefit to be derived from the use of electricity after the decline of

the acute symptoms, and a subsidence of the excessive tenderness of the joints. In my own experience, this point has been satisfactorily determined by observations in cases where, in repeated previous attacks, convalescence was more prolonged than after resort was had to treatment by the method of general faradization.

Subacute articular rheumatism is far more favorably affected by electrical methods of treatment than the acute form, but even in these cases it must be admitted that the remedy acts with a degree of capriciousness that is often very discouraging. There are some cases that will not be benefited at all by electricity, and I have known a number in which increased pain, heat and redness were occasioned by any and every attempt in the use of this agent. These unsatisfactory results must be attributed not so much to the disease itself, as to the peculiar individual idiosyncrasies that occasionally assert themselves vigorously under electrical treatment.

There exists a class of cases of the subacute variety of rheumatism, which has served an excellent purpose in fostering the credulity of those who make of electricity almost a panacea in the treatment of rheumatic conditions.

Under any circumstances, either with or without treatment, the duration of these cases is exceedingly short, in many instances not exceeding two or three days. Now, in an attack of this kind, if one is so fortunate as to see the case *ab initio*, and electricity is employed, to electricity is given the entire credit of the cure. I well remember a perfectly honest but ignorant so called electrician, into the mysteries of whose practice I gleaned some insight many years ago. He believed electricity to be an unfailing remedy in rheumatism, and this belief was shared by a multitude of people influenced by his success in these transient subacute cases of rheumatism which came to him in large numbers, and as soon as the first symptoms of pain manifested themselves. But there is another not infrequent group of rheumatic cases of the subacute variety in which electricity serves a most excellent purpose, allaying irritability, lessening the heat and pain in the joints, and appreciably shortening the duration of the attacks. It does more than this. From a considerable experience, I can confidently assert that by its use the severity of subsequent attacks will be greatly lessened, even if the tendency to recurrent paroxysms is not entirely destroyed. I am well aware that these cases of subacute rheumatism occurring in persons approaching middle life, or beyond it, tend in subsequent attacks to lessen in severity sometimes, but careful observation in many cases enables one to discriminate between what is and what is not the result of the treatment administered.

According to my own experience, the one satisfactory method of electrical treatment in these cases is the method of general faradization. Purely local applications, while perhaps not altogether useless, are by no means so efficient as the general methods. I have, time and time again, because of the labor entailed and the objections of patients to disrobing, confined my efforts to applications to the joints alone, but always with results unsatisfactory when compared with the general method of treatment.

Muscular rheumatism is also, in many cases, obedient to some form of electricity in a very marked degree.

We have here a condition affecting mainly the fibro-muscular structures, associated with pain and sometimes spasm of the affected part. The exciting cause is most frequently exposure to draughts, and such exposure is especially apt to be followed by severe and persistent attacks, if associated with it there has been any strain or sprain of the fibro-muscular structure. Another condition favorable to sudden rheumatic attacks is the lithic acid diathesis. If there exists defective oxidation of the nitrogenous elements of food, the waste products fail to reach the ultimate stage of urea and circulate in the blood in the form of uric acid, and it only requires a local slowing of the circulation, or a temporary cooling of an extremity, in order to have a deposit of the sharp-pointed crystals in the joints, ligaments or muscles, which cause such excruciating pain. It is unnecessary to enter into any detailed description of the symptoms of muscular rheumatism.

As a rule, although not in every case, rest greatly alleviates the pain, while movement of the affected muscles is attended by sudden spasmodic pains of a severe character. It hangs on with varying degrees of persistency, from a few days to weeks or months, and in some of the more severe cases, involving the fibro-muscular structures, it has been known to occasion years of suffering. All three forms of electricity —galvanic, faradic and static—are of value in the treatment of muscular rheumatism; but taking the cases as we find them, I myself have not only found that static electricity is the most efficacious of all the electrical methods, but among those who have experience with the three kinds in the treatment of the disease, the same judgment I find prevails. If a case of muscular rheumatism came to me in which the pain was more of a neuralgic type, and with considerable tenderness to pressure—especially slight pressure—I should choose either the galvanic or the faradic current of high tension, preferably the former. In a certain proportion of such cases it will be found that this treatment, if intelligently administered, will give immediate temporary relief, as well as hasten recovery, while static electricity will, as a rule, afford no relief, but may even aggravate the pain. An exception must, however, be made in favor of the static induction current, which, with its infinitely rapid succession of sparks, becomes dynamic in character and allied in its effects to the faradic current of high tension. If, however, the opposite condition of things prevails, as is more frequently the case in chronic muscular rheumatism, static electricity is capable of far greater relief than either of the other two forms.

In these chronic cases there is often but little pain on pressure—indeed, pressure often affords relief. The pain is dull and aching, even when the parts are in repose, and seemingly very deep seated. We do, in fact, see many cases where the pain becomes entirely subdued during more or less vigorous and protracted exercise. The excitation of the circulation and the heightened activity of the various excretory and secretory processes of the body, seem for the time being to take away every reminder of the disease. The method to be adopted is the simple one of insulation and submitting the patient to the effects of the roller electrode over the affected parts. It is by no means a pleasant method of procedure, but if continued for fifteen or twenty minutes, more or less, the relief afforded is quite remarkable. I have known cases of lumbago, after suffering for weeks, to be completely and permanently relieved after a single séance of this kind.—Rockwell, *N. E. Med. Mo.*

Medical News and Miscellany.

DR. WALTER A. FORD sails on the 4th of June for Germany and Sweden, to visit their medico-gymnastic institutes.

THE *Texas Sanitarium* publishes the following announcement:

This page and the page facing last reading were occupied for four months by advertisements of the Index Publishing Company, Dr. S. P. Britt, and P. P. W. Spence—all of 37 College Place, New York—as alleged, on a contract with one Robert Wilson, an alleged advertising agent, who gave his address at same place. As we have been unable to get any money for any of the advertisements, or any reply to any letter on the subject, we have been compelled to drop them. Several publishers warned us that such would be the case, but having made the contract, we felt obliged to run the ads. one-quarter before presenting bill, as is customary. Our draft was returned, marked, "no such parties found at address."

To the above we may add the Barr Electric Manufacturing Company, of 17 and 19 Broadway, New York, whose advertisement occupied the fourth cover page. They have totally failed to meet their obligations.

☞ No charge for this notice.

Just right! There are a few people who make a business of swindling medical journals out of their advertising bills, and the best way to stop them is to publish the facts. This is all the more a necessity, as, when a journal has been so unlucky as to introduce one of these firms to its readers, it owes it to the latter to give due warning of the character of the parties. We publish below a list of advertisers and others whose accounts have not been settled. Some of these may be due to neglect, and, if so, we will drop their names from the list when settlement is made:

Robert Wilson, for Index Publishing Company.
Barr Electric Manufacturing Company.
The Underwood Water Company, of Maine.
Dr. C. W. Parker, Nashville, Tenn.
Gum-Elastic Roofing Company.

IN an article recently published in the *Southern California Practitioner*, entitled "A Medical Man's Notes in Japan," by Dr. D. G. MacGowan, the following reference is made to the subject: "Prostitution is licensed, and practically confined to certain sections of cities, which have local names. That at Tokio is termed Yoshiwara, and is surrounded by a moat and approached by a drawbridge. Here are a number of tidily kept streets, lined with many neat and elegant houses, from two to four stories in height, richly furnished and decorated, and lighted throughout with electricity. Each house has a great bay-window upon the ground floor, in which the young girls, gorgeously attired in silken robes of scarlet, squat upon glorious Eastern rugs, each before a copper brazier, waiting to be chosen by the god of love. These girls are usually sold or indentured for a certain term of years to the houses by their parents, or sometimes they article themselves to support an ailing mother or father, or to secure a dowry. Their time expired, they return to their homes if they like, and the life they have led is no bar to their marriage. Indeed, I have heard it said that in old Japan they found husbands more readily than their more virtuous and less experienced sisters. Each house and each inmate of it is taxed. They are under constant police surveilance, and medical examination is made of each girl once a week. I could get no authoritative estimate of the number in the Yoshiwara, but averaging the numbers given me by different people, I should judge that it contained about ten thousand of these prostitutes."

PHONOGRAPHING THE LANGUAGE OF THE APES.—But the use of my (wire) cage will not be limited to a mere place of safety from wild beasts that prowl through the forests at night; it will serve also as a depot for my supplies, and thus save me the trouble and expense of having to find a place of safety for them in case of delay or absence. This structure will be locked securely to the adjacent trees by three strong chains attached to a Y-shaped iron bolted through the top of the cage. It will be provided with a canvas top and gum-cloth sides, mounted on rollers like window-curtains, and easily managed. It will be provided with a rubber mat or carpet, which will serve as an insulator when the cage is charged with electricity, and will also prevent the moisture from rising from the ground beneath the cage, in which I shall have to sleep a great part of the time. It will contain a hammock and camp-chair. Besides these it will be occupied by my phonograph, photographic instruments, telephones and electric battery with which to operate them. A single charge of this electric battery will last for about 300 consecutive hours. By the use of a small switch-board I shall be able to fire my flash-light at night, or to snap my kodak in the daytime, and to operate my telephones if necessary. In case of danger or unexpected attack, by the use of my switch-board and by means of an induction-coil, I can charge the entire cage with electricity, developing an alternating current of about 300 volts. In leaving my cage with its contents for any length of time, I shall simply charge it in this manner with electricity, in order that in my absence my meddlesome neighbors may be induced to let it alone. A unique and marvelous experiment among the many which I expect to be able to perform is that of phonographing the sounds of the apes at a distance from my cage, where my phonograph will be located at times. I shall accomplish this by means of the telephones which I am having constructed for the purpose, with a water-proof cable wire connected at one end with the diaphragm of the phonograph, and at the other end (which may be carried any distance, even a mile or more through the forest) connected with a small telephone concealed in a tin horn; all of which will be painted a dingy green, in order that it may be concealed in the leaves or hidden in the moss or undergrowth of the forest.—*From "What I Expect to Do in Africa," by Prof. R. L. Garner, in North American Review for June.*

Army, Navy & Marine Hospital Service.

Changes in the Medical Corps of the U. S. Navy for the week ending May 28, 1892.

TURNER, T. J., (retired) Medical Director. Granted one year's leave of absence, with permission to leave the United States.

GATES, MANLY F., Assistant-Surgeon. Ordered to Naval Hospital, Portsmouth, N. H.

URIE, J. F., Passed Assistant-Surgeon. Detached from Naval Hospital, Portsmouth, N. H., and to the U. S. S. "Chicago."

BYRNES, J. C., Passed Assistant Surgeon. Detached from the U. S. S. "Chicago," and granted three months' leave of absence.

PROMOTIONS.

HARRIS, H. N. T., Assistant-Surgeon. Promoted to Passed Assistant-Surgeon.

WILSON, GEORGE B., Assistant-Surgeon. Promoted to Passed Assistant-Surgeon.